The Iron Age

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The New Otis Hoisting Engine.

Furnace and mining engineers will appreciate the design and construction of the "New Otis" hoisting engine, shown on this page. It is manufactured by Otis Brothers & Co., 92 and 94 Liberty street, New York, who have made hoisting and elevator machinery a specialty for over 30 years. The engine, while being designed more especially for blast-furnace duty, is adapted for all kinds of hoisting service, and can be arranged for any depth of shaft or hight of lift. Among its special features are the valves. The center or change valve is the ordinary slide-valve, and by simply removing the steam-chest cover it is readily exposed. The eccentric-valves are their standard piston-valves, and can be reached independent of the other. This combination of the valve movement is peculiarly their own and is worthy of some note. The steam cylinders are placed directly over the stands, which, on the whole, is considered preferable to overhanging cylinders and guides, as in some other engines, in which the necessary rigidity is obtained by means of brackets or arms. Every part of the engine is readily accessible and the shafts and gearing are so arranged that either can be removed without disturbing the other or removing the stands or drum. The gearing is extra heavy, and the first motion is machine-cut, insuring smoothness of running and durability. Every part of the gearing is covered, preventing accidents and damage from obstructions. The engine in all its details is built very heavy, of the best materials and workmanship.

The automatic safety attachments are the Otis standard safety devices. The engine is also adapted for inclines and fillings by the automatic skip and dumping apparatus.

The Corrosion of Marine Boilers.

At the recent meeting of the British Institute of Mechanical Engineers, held at Cardiff, the following paper on the "Corrosion of Marine Boilers" was read by Mr. J. H. Hallet:

The principal causes of corrosion may be discussed under the two heads of defective design and defective management, which is equivalent to saying that an ordinary marine boiler will hardly be subject to corrosion at all if well designed and well managed. The most frequent fault is absence of space for examination. The tubes are often placed so far out in the wings that it is impossible to get down to look at the sides of the furnaces, or so close to the furnace crowns that there is no room to get over these. It would be preferable to allow at least 9 inches between each furnace crown and the bottom row of tubes, especially as this row is not useful as heating surface when placed so close down to the crown. Manholes are often inconveniently placed and too small, which affords an excuse for inattention on the part of the men in charge. Manholes should always be fitted in the wings if the size of boiler will allow. A manhole at the bottom of the back end is also to be recommended. There can be no doubt that the best way to prolong the life of a boiler is to watch it carefully and constantly, so as to note the commencement of deterioration and take steps to check it. Another fault is the pitching of the steam space stays so that they come over a space instead of over a tube, thus rendering the effective use of the scaling tool very difficult. With the object of securing the conventional 20 feet square of heating surface per horse-power, the tubes are sometimes too closely pitched, which causes bad circulation, besides rendering the spaces liable to become soon choked with scale. The tubes should never be less than 1¼ inches apart, both vertically and horizontally.

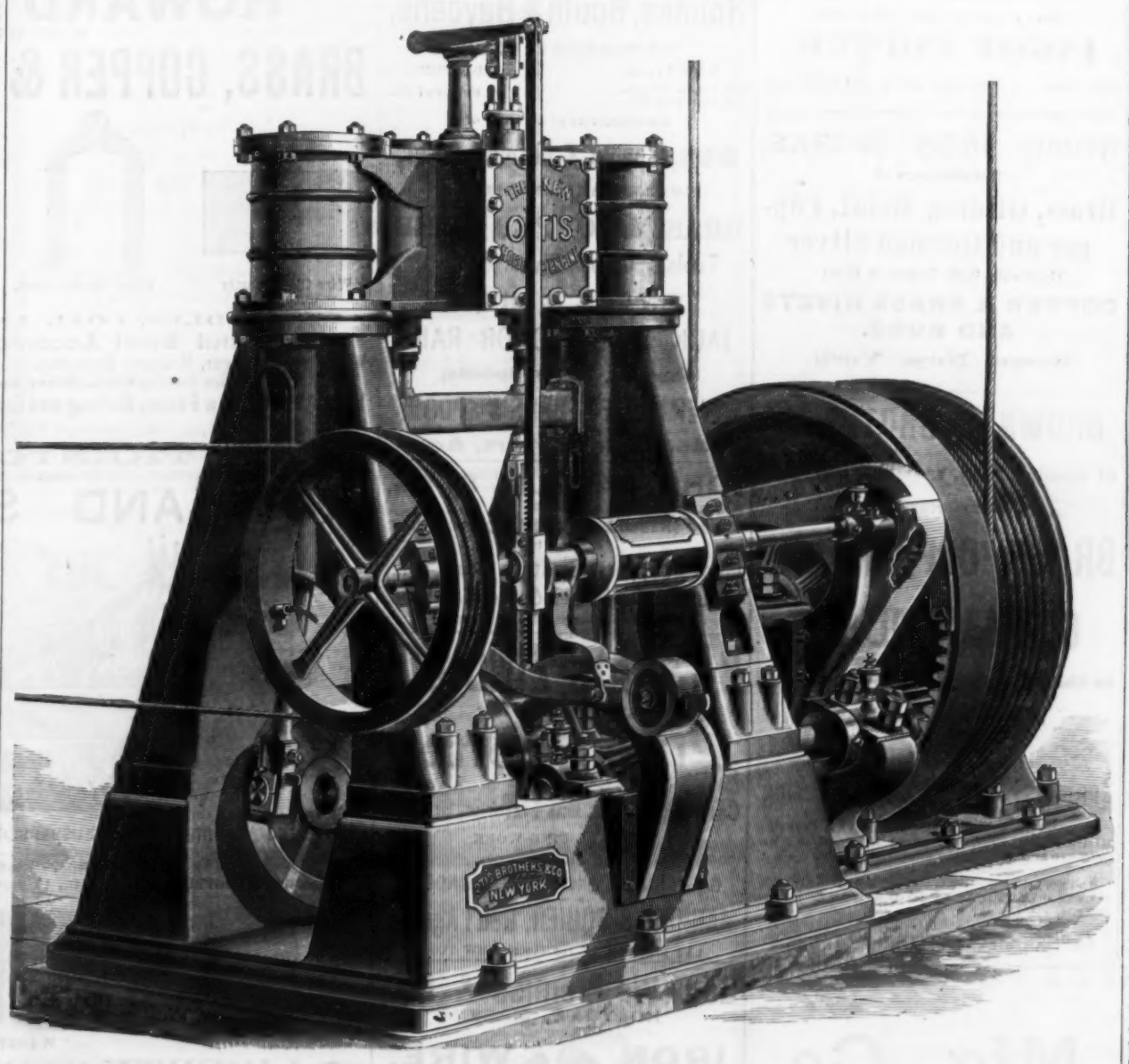
The first point to be looked to in the management of a boiler is the circulation. In an ordinary multitubular marine boiler the circulation takes place by the water ascending from the furnace crowns and the sides, backs and fronts of the combustion chambers, and descending at the wings; the tubes do, of course, somewhat obstruct the upward current. Double-ended boilers, being longer, are more prone to suffer from racking strains, due to the difference of temperature between their upper and lower parts. One method of reducing this difference as far as possible is to fit the internal feed-pipe so that it is led on a level with the upper tubes, so as first to warm the water inside it, and is thence carried down so as to discharge the warmed water in a horizontal direction at the bottom of the boiler. The scum-pipe should be fitted with a pan shaped like an inverted saucer, and placed just above the level of the water for the scum to collect under it, and it should always be blown off upon raising steam, and also about once a day when under way.

The blow-off cock should either be attached at the bottom of the boiler, or else an internal pipe should be fitted to it, reaching down to the very bottom. Salt is not deposited until the density of the water exceeds $\frac{4}{32}$ by the salinometer—that is, until there is more than 4 pounds of salt in 32 pounds of water; beyond this proportion the deposition of salt then begins upon the furnace crowns, &c. It is recommended that the opportunities occurring from time to time by the engines being stopped should be taken advantage of for pumping up the boiler to the top of the gauge glass, and then blowing it down to the bottom of the glass. This repeated about twice or thrice on each occasion will work wonders. The great usefulness of this plan arises from the fact that while the engines are stopped there is little or no steam being made, and therefore no solid matter is being deposited from the water, so that the extra feed-water pumped in at that time does much more to freshen the boiler than it would if the engines were at work. When in charge of the engines of a steamer on a voyage from England to Rangoon, calling at several ports on the way, and thence to Venice, the author kept water in the boilers continuously during the whole round—that is to say, the boilers were never entirely run out and refilled, but were blown down from time to time as above described. They were under steam about 72 days, and upon being opened out at the end of that time had only a slight scale upon them of uniform thickness, and no indication of pitting or corrosion.

The mode of treatment adopted by the author for new boilers is to have them well washed out before filling; then to run them up, and when they are filled with water up to the normal hight, to throw into each through the top manhole about a bucketful of common soda. When steam is raised to about 30 pounds per square inch, blow out a little through the scum cock. Before adding any more water start the feed donkey and let it deliver for some time over the side of the ship, so as to get rid of any dirt, &c., in the pump. This is a very useful precaution to observe whenever the feed donkey is employed. After starting the main engines let them run at first with the feed-water overflowing from the hot-well into the bilges; this will clear the condenser. When under way it is advisable to use the blow-down cocks sparingly. The appearance of the water in the gauge glass shows at a glance the state of the water in the boiler; if the glass is at all dirty inside, that is proof positive of the water not being clean enough, and this can be cured by the use of the scum-cock. In a double-ended boiler a scum pipe should be fitted at each end. The scum-pipes are sometimes so fitted that their position can be altered to suit the trim of the ship, which is a point of far more importance than is generally imagined. After a run, when steam is finished with, the water should be blown from the bottom, and the boilers then kept thoroughly dry. Before refilling they should be carefully swept down inside and washed out.

There is no doubt that one of the most active cause of deterioration in boilers is the want of proper care in their treatment. Cases have come under the author's notice of boilers being blown down as far only as the level of the bottom manholes, and refilled, without care being taken to draw the water out of the bottoms. This process having been frequently repeated, the water at the bottoms became so impregnated that the heads of the rivets and the lower half of the compensating rings round the manholes were corroded away, while the other parts of the boilers were in good condition. Many good boilers are ruined through careless management, and the makers are wrongly charged with allowing their work to come from the shop not properly finished. Another example, out of numerous cases met with, is that of a pair of boilers which were fitted some little time ago with hydro-kineters, or internal steam jet nozzles for stimulating the circulation of the water in the cooler spaces below the furnace flues. Upon a recent examination the valves of these appliances were found to be hard and fast, in consequence of carelessness in supervision. Another great evil is raising steam too quickly, and blowing out under too great a pressure, which cannot be too strongly condemned. Corrosion in the upper parts of the boilers is principally caused by the introduction of oil, tallow and other greasy substances from the engines. In all the steamers with which the author is connected he has discarded the use of all oil or other lubricant in the cylinders, with the most satisfactory results. Various remedies have been suggested for preventing corrosion—among others, air extractors and circulating tubes. Zinc has been tried, both cast and rolled, and some engineers report favorably on its use; but to make it effective very large quantities must be used, as it so quickly oxidizes, and thus loses its protective qualities. The electrogen of Mr. Hannay's invention, which is gaining favor, is a simple appliance, and, as far as the author has experimented with it, is very effective. It consists of a ball of zinc cast upon a copper bar; on each end of the copper bar a wire is soldered, and the two wires are again soldered to different parts of the boiler, so as to obtain metallic contact. Boilers which had shown a tendency to corrosion looked quite healthy in a very short time after these appliances had been fitted to them.

Marine boilers are not troubled with much external corrosion, especially modern boilers, because much more care is now taken in fitting them into the ships than was formerly the case. They are now properly coated, and are not fitted too close down to the bottom of the ship, plenty of room being allowed for access to the seams. But all the mischief to be contended with is not confined to the water side of the boiler. There is nothing like cleanliness to prolong the life of a boiler. When a vessel is to be laid up a good plan is to pump the boiler full up to the very top of the dome, and keep it so until it is again required. Another method of preserving a boiler not in use is to empty it and clean it thoroughly, then close all the manhole doors except one at the bottom, put in a small stove full of burning coke, and close up the bottom door quickly. The object of both these methods is, of course, to exclude air as thoroughly as possible.



THE NEW OTIS HOISTING ENGINE.

The Purification of Gas by Oxide of Iron.

We take from the Abstracts of the British Institution of Civil Engineers the following account of oxide of iron in a gas purifier, which originally appeared in a French periodical: Gas purification is generally effected either with lime or with oxide of iron. Lime possesses the advantage of eliminating both carbonic acid and sulphureted hydrogen, while oxide of iron only acts on the latter. Oxide of iron, however, is in many respects preferable. Lime can only be used once, and is converted into carbonate and sulphide, which are not only valueless, but injurious, and frequently difficult to dispose of. The hydrated oxide of iron, on the other hand, can be returned over and over again to the purifier, because the sulphide of iron which is formed by the absorbtion of sulphureted hydrogen becomes reconverted by exposure to the air into the hydrated oxide and sulphur; thus a minimum quantity of material is required, and the products have a commercial value which frequently covers the cost of purchasing the original material.

Various substances have been employed for gas-purification, among which are: Laming's purifying material, which may be considered as intermediate between lime and oxide; the refuse of pyrites; some iron and ocher ores; the residue from the manufacture of aniline, and the mixture made by the Diecke process with iron borings. On account of the high temperature to which pyrites are exposed, the residues contain oxide of iron in a very inert state, on account of which they are with difficulty dissolved by acids, and have only a feeble action upon sulphureted hydrogen, and, being in lumps varying between the size of a pea and a nut, they do not present a large surface to the gas; they also at times contain as much as 10 per cent. of sulphate of iron, which is also without influence upon the sulphureted hydrogen unless ammonia is present in the gas. A current of sulphureted hydrogen may be passed through a solution of sulphate of iron without any being absorbed, but an energetic reaction will take place if an alkali is added to the liquor. The utility of ocher and other ores is frequently much diminished on account of the small surface they present to the passage of the gas, as well as from the presence of organic residues. The substances obtained in large quantities in the reduction of nitro-benzene, and which constitute the residue from the manufacture of aniline, contain sesquioxide, forming artificial magnetic oxide (*fer oxydulé*), which has no effect upon sulphureted hydrogen. Diecke's purifying material, which is generally made at the gasworks by mixing old material with iron borings, is without doubt one of the best, as it contains the oxide in a minutely-divided state, but it is difficult to prepare it of a constant and homogeneous composition, and it contains 20 per cent. of sulphur before it is brought into use.

More attention is generally paid to large proportions of iron in the material than to the form under which it exists, and to other conditions which are of considerable importance for the purification of gas, such as its state of subdivision, its degrees of oxidation and hydration, and the presence of foreign substances which may diminish its efficiency, so that the results obtained are often below what is expected. In deciding upon the composition of a purifying material which should avoid these objections, the following points are suggested: It should contain the largest possible quantity of oxide of iron in a state of hydrated sesquioxide, and in the form of a fine powder, without any foreign substance which might diminish the efficiency of the oxide, and it may be desirable to add some substance to increase its efficiency. To produce a purifying material fulfilling these conditions, it is proposed to roast finely-powdered natural iron ore in a furnace with carbonate of soda. This gives a mixture composed of sesquioxide of iron, soda, silica and any alumina contained in the ore. This mixture is treated with water, which precipitates the iron, the foreign matters being dissolved; the precipitate is washed by decantation until the washings do not indicate more than 1° Baumé, and is then dried at a slightly elevated temperature. The material thus obtained contains 70 per cent. to 80 per cent. of hydrated oxide in a fine powder, and 5 per cent. of carbonate of soda, the remainder being moisture, sand, &c. It is claimed that, on account of the large proportion of finely-divided oxide of iron that this product contains, with the addition of the soda, it has a very energetic action on the sulphureted hydrogen from the commencement of its use, and that it will therefore purify with more certainty and rapidity than other materials, of which the action is imperfect. The revivification of the material takes place easily and rapidly, on account of the large quantity of sulphureted hydrogen it absorbs each time it is placed in the purifier; spontaneous combustion, however, does not take place, on account of the presence of the soda. On account of its finely-divided state and porosity, it will absorb substances to be precipitated in a solid form, such as carbonate of ammonia, of which some traces always exist in the gas; and it is also claimed that, on account of the presence of the soda, it will take up the bisulphide of carbon and other sulphur compounds, which are not arrested with ordinary iron oxide. The results obtained by its use are given as follows: 1 c. m., or 1000 kg. (about a ton) of the material will, before needing revivification, purify 5000 to 18,000 c. m. of gas, and even more, and it can be revivified 30 to 40 times, and consequently would purify 150,000 to 500,000 c. m. (5,297,400 to 17,658,000 cubic feet.) These variations in its efficiency are more apparent than real; the proportion of sulphur in the gas varies with that contained in the coal; the temperature of the retorts; the length of the charges, and the amount of condensation and scrubbing; its efficiency is also influenced if tar is present in the gas. The above results may therefore be considered as the extremes. The cost of the material is given at 25 francs per c. m. (ton) at Ludwigshafen, on the Rhine.

In the course of a lecture on the "Economic Applications of Seaweed," recently delivered before the British Society of Arts by Mr. Edward Stanford, F.C.S., the lecturer spoke of the establishment in the Hebrides of works for the recovery and treatment of seaweed. The princial product sought to be made in these works was iodine, but in the process the weed was calcined in retorts, and the works were lighted by the gas produced during distillation. It was stated, however, that, owing to the presence of salts of sodium, the gas after passing through a series of purifiers still burnt with a strong monochromatic yellow flame. Iron retorts, heated by coal or peat, were first used, but have been superseded by brick ovens. The tangleweed swells in the oven, and produces a very light and porous charcoal, without sulphides, from which the salts are easily washed out. This charcoal is more like animal than wood charcoal. Ammonia is collected from the distillate, and is used on the farm attached to the works, and the tar is utilized on the roofs, &c.

According to the recent researches of M. Bouty, the neutral salts in very extended solutions of water form a group apart as regards their electric conductivity. For example, ethylic alcohol, glycerine, erythrite and phenol, glucose and candied sugar, ordinary ether and dichlorhydrine, ethylic aldehyde and acetone, as well as albumen, all conduct very badly. M. Bouty has also come to the conclusion, from his experiments, that an anhydrous alkali or acid is not a conductor, but that a hydrated acid or alkali conducts like a salt.

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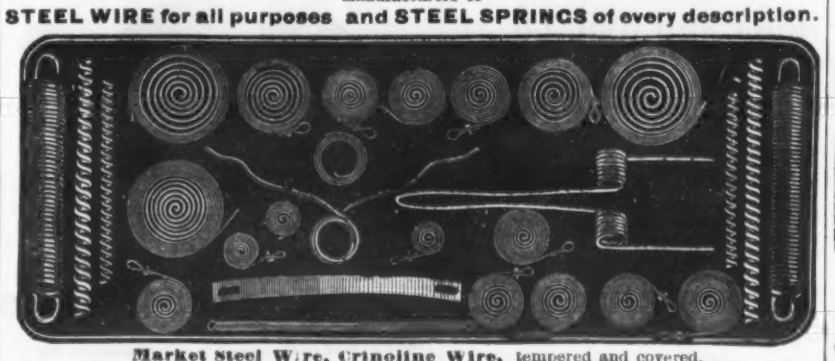

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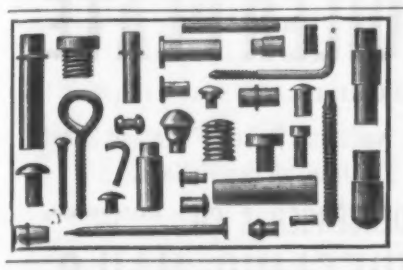

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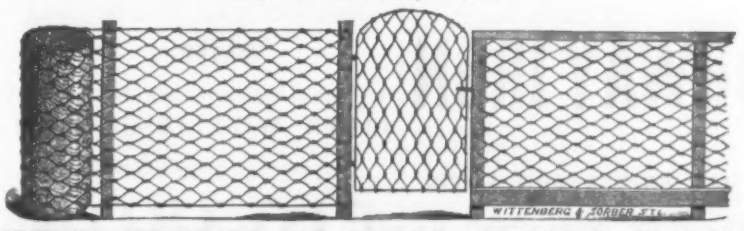

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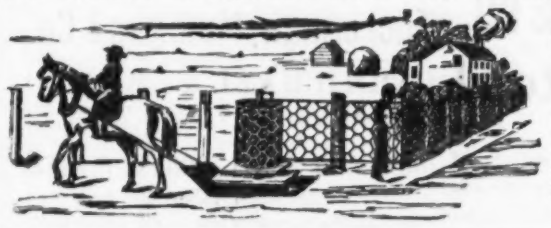

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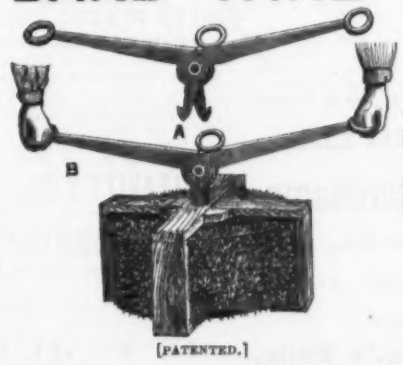

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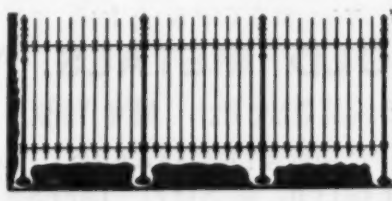

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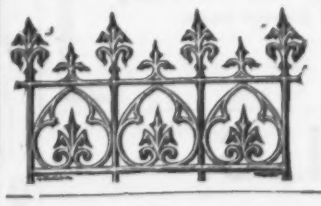

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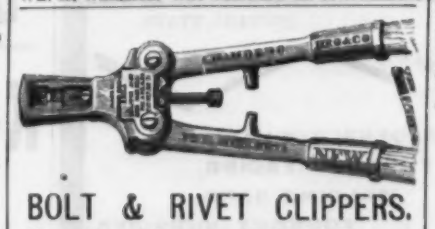

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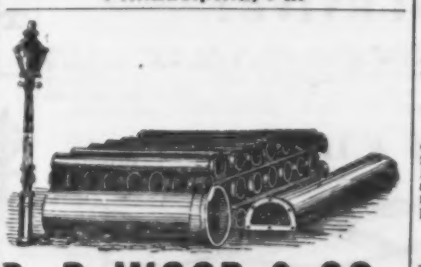

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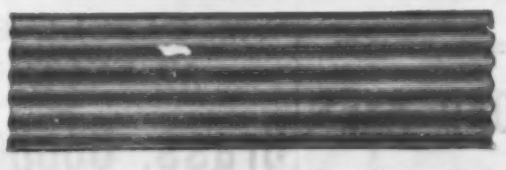

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Co-operation at Guise, France.

At a time when so much attention is directed to the betterment of the workingman's condition, the following description of the plan of co-operation followed at the factories of Guise, France, will prove of interest as showing the beneficial results that follow such a system of modified communism. The account which we give is a translation from an article in *Le Genie Civil*, which appeared in a recent issue of the *Iron and Coal Trades Review*:

For a considerable number of years the stove and ironmongery factories at Guise, on the frontiers of France and Belgium, have attracted attention from the peculiarity of the social arrangements which are a leading characteristic of them, namely, the housing of the families of the workpeople in large barracks. At a time when the majority of the leaders of labor in France were pulling down as worthless rubbish their old barracks, and were loudly proclaiming themselves in favor of a separate and independent house for each family, the "Familistère" or "Social Palace" of Guise, which had existed since 1859, was still gathering the families of workmen together to a degree of overcrowding seldom met with, even in the heart of our largest cities, and was thus seeming to set public opinion at defiance. During the last few years another arrangement—an alteration in the methods of labor, which has made less noise in the world than the "Familistère," but which is really an innovation much more important, and one still more subversive of general custom—has again attracted public notice to the Guise factories. At the time of writing this establishment offers in every department an appearance absolutely unique, which it will be of interest to describe fully.

I. ORGANIZATION OF LABOR.

The organization of labor in the factories of Guise and of Laeken presents two special points—first, the most thorough association of capital and labor ever seen, and, secondly, the continuous purchase of the factory by the workmen by means of the dividends due to labor.

In 1880 M. Godin, the proprietor, transformed his enterprise into a society, a simple limited liability company, consisting at present of himself and of 1022 others, belonging for the most part to the 1322 persons who constitute the employees of the factory.

M. Godin furnished the entire capital of the company, consisting of the "Familistère," the factories at Guise and Laeken, with their accessories, materials, models, patents, &c., representing a sum of 2,288,383 francs; of raw materials and finished products of the value of 1,956,012 francs; of sales, agreements, contracts and orders not taken at any estimated value; and of a total of 356,604 francs in cash and securities, making in all some 4,600,000 francs. The other 1022 members only brought into the firm, on entering, their own individual personal value, professional and moral, as determined by the conditions fixed by the statutes or by the free estimate of the founder. The duration of the association has been fixed at 99 years.

The fundamental principle of the association is that every "productive element" should share in the result in proportion to the services it renders. These elements are three in number, namely, directive ability or management, capital and labor. These three are entitled to share in the profits in proportion to the amount of service which each renders. But what is the proportion? Some time back M. Chaix, during an inquiry held by the Minister of the Interior, made the following remark: "Perhaps some day intelligence will receive a third, capital a third and labor a third of the gross profits."

The method at Guise is founded in a large measure on the same basis. The share of intelligence is in effect about half of the united shares of capital and labor. It is only in the apportionment of the shares of the two last-named components that any difference exists. M. Godin disclaims the idea of an equality between them. He declares that they may have very different values, and that the division ought to be in proportion to these values. It remains, then, to fix upon a common measure of the two. M. Godin has assumed that this ought to be the necessary remuneration, apart from profits. Now, the remuneration of capital is interest; that of labor, wages. Interest and wages, then, are the two elements to be considered in the division between capital and labor. It results, then, that a portion of the net profits, 25 per cent., being set aside for the reserve fund, management draws 25 per cent., and capital and labor between them divide 50 per cent. *pro rata* on their respective remunerations.

In the course of business in 1882–83 the total wages of labor amounted to 1,888,000 francs, and the interest on the capital to 230,000 francs. The share of each, then, in the profit was:

$$1st, \frac{50}{100} B \times \frac{1,888,000}{1,888,000 + 230,000}$$

$$2d, \frac{50}{100} B \times \frac{230,000}{1,888,000 + 230,000}$$

The share of labor has, then, actually been eight time as great as that of capital.

This division of the emoluments appertaining to capital and labor is one of the characteristic traits of the Guise system. In the majority of methods of sharing profits which we have examined they have been divided between capital and labor in a fixed and arbitrary proportion, either made public or kept private. There is scarcely any works except "The Providence," at Coulommiéres, which has admitted a proportional division between capital and labor, but the value of the two elements has there been fixed by taking the amount of the capital and the sum of the wages. At Guise, capital being represented by its interest at 5 per cent., its share is just 20 times less. It is not, however, in this only that the principal originality of these establishments consists. The novelty above all lies in the use made of the share of the profits acruing to labor. These shares are in effect wholly and obligatorily appropriated at present to the purchase of the capital of the founder, and next, after the entire repurchase of these shares, to the acquirement of the shares of the different sleeping part-

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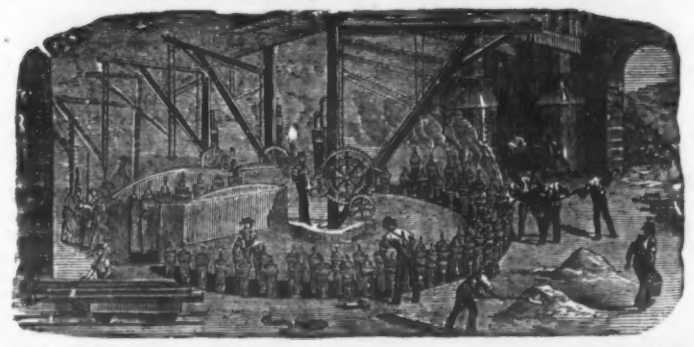

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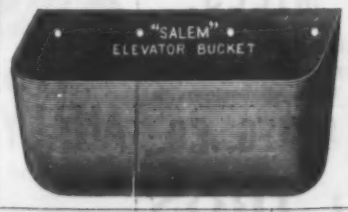

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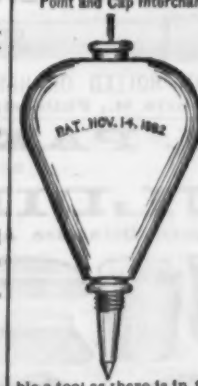

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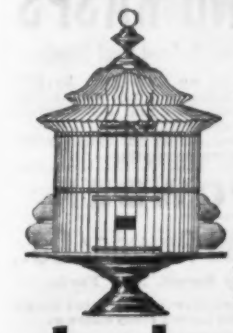

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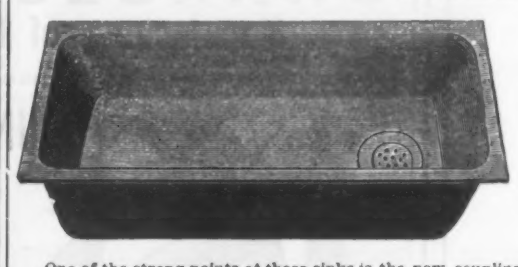
FIG. 120.


FIG. 209.


FIG. 70.

Wrought Steel Sinks.



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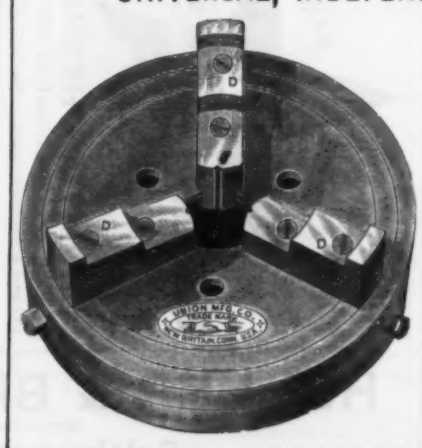

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ners, in order of seniority. By this means the factory will pass first from the hands of M. Godin into those of the members of the association, then successively into the hands of various generations of co-operative workmen. The difference is obvious between this establishment and others carried on on the "distribution of profits" system. In some the stock of the company is at the disposition of the workmen,—notably at the establishment of M. Laroch-Joubert—but the purchase of this stock (of which only a very few shares are offered) is left at their option, while at Guise it is compulsory, and is applied in succession to all the funds of the company. At the present moment the workmen at Guise are in possession of shares in the factory to the value of 1,969,000 francs; in 12 or 15 years they will own the whole.

We should have liked to have given the details of the internal organization of the workshops, but, lacking the space, we have only room for one matter relative to the pay. The employees of the workshops and of the "Familistère" have been divided into four equal sections, in alphabetical order; each of these sections is paid on a different day, and the payments, which are made fortnightly, take place twice each week, on Tuesdays and Fridays. As these sections comprise men belonging to different workshops, or to different sections, it follows that men who have been paid find themselves working side by side with men who have not yet received their wages; they do not, therefore, ask them to drink, because the latter cannot "stand treat" in their turn. This plan, then, has put an end to those causes of temptation so common in workshops where the hands find themselves all at the same time in possession of a sum of money relatively of considerable amount; and has thus developed valuable habits of temperance. We have noticed, for instance, in some mines that the custom has been to pay the men of one pit one day, the next pit another day, and so on. This is a step in the right direction, but still inferior to the plan at Guise, for the workmen who labor together in the same pit are in funds at the same time, and that is just the thing to avoid; payment in alphabetical order is the only plan which gives real security.

II.—ADMINISTRATION.

The administration of the Guise factories, although in great part in the hands of the workmen, is essentially an aristocratic and authoritative one. One might be impressed with the idea that this factory should be devoted to all the socialistic utopias, and especially to the utopia of equality. If anywhere the desire for equality among workmen could be satisfied, one would imagine that Guise was the very place. Nothing, however is further from the truth. The organization is absolutely "anti-equalitarian." The difference in the worth, both moral and professional, of individuals is marked at Guise more strongly than elsewhere by very dissimilar rights and duties, and a share in the direction is only accorded to a few of the best men, very carefully selected and tested. The aristocratic principle of the factory betrays itself, first, by the division of the employees into five classes of different degrees of merit, and differently treated—the associates, the members, the sharers, the interested assistants and the auxiliaries. The first three classes are subjected to very rigorous rules; morality and and irreproachable conduct are absolutely necessary, the men being subject to dismissal in case of drunkenness, misconduct in the family or in the building, dishonesty, idleness, insubordination, disorderly conduct or acts of violence, or infraction of the rule requiring children to be educated. Under this common condition the qualifications required from each of these classes decrease in importance as they pass from that of the associates to members, and so on, and the advantages and rights attached to them decrease in the same order. The associates, who form the head of the administration, undergo the most rigid tests before admission, and they enjoy the most extensive priviliges, while the auxiliaries, at the other extremity of the list, have no conditions to fulfill, and only participate in the mutual assurance. Associates must be 25 years of age at least, five years in the "Familistère," and, further, must be admitted at a general meeting of associates. In return, they can only be excluded by a vote of a majority of two-thirds of the general assembly; they have two shares in the profits, against one and a half, and one alloted respectively to members and sharers; they have priority over all the others in being employed in case of scarcity of work; they alone compose the general meetings, and when compelled by age or sickness to give over working in the association they continue to enjoy the advantages resulting from co-operative living, with the right of sitting and voting at general meetings. The associates elected members of the Committee of Management have alone the right of voting at their committee meetings; the same with regard to the committee of the "Familistère." Lastly, the manager who shall undertake the duties now performed by M. Godin, after the death of that gentleman, can only be chosen from among the associates

It is unnecessary to define the rights and duties of the other classes of men forming the association; they decrease in proportion. As will be seen, it is the aristocrats of the employees who hold, after M. Godin at least, all the power and the greater part of the advantages. The authoritative principle of the Guise organization betrays itself in a series of reservations in favor of the founder and of the association.

1. *For the Founder.*—Right of accepting or rejecting nominations for the rank of associate, member or sharer; of nominating for either of these ranks persons whom he considers worthy, though not fulfilling all the conditions required by the rules; of doing away with the time limit in their favor; of being managing director for life, with power of nominating his successor, either by word of mouth or by will; of proposing alterations in the statutes without being bound by certain clauses; of power of suspending men of the rank of members and sharers from the advantages accruing therefrom, in case of scarcity of work, after due notice given to the Committee of Management.

2. *For the Association.*—Right of buying out any holder of capital stock, or of savings invested, paying him at par: in the case of the death of a holder of investment coupons, without children or lineal descendants, and whose heirs are neither associates, members or sharers, the right of causing the withdrawal of the stock for 50 per cent. of its value, the surplus being transferred to the credit of the mutual assurance fund.

It is, however, expressly stipulated that the association is represented by associates alone, and that the shares in the mutual funds, determined by the signed certificate of capital or of invested savings, do not confer upon their holders any right of interference in the plans or affairs of the "Familistère," the factories or the association. The principle of authority, therefore, is maintained in all its force, and all compromising or dangerous interference with it is firmly repressed.

III.—MUTUAL ASSURANCE.

Assurance is of two kinds—assurance of the necessaries of life and assurance against sickness and old age. The assurance is entirely managed by the committees specially elected for that purpose, whose members are paid in proportion to the time devoted to the business of the committee. The assurance of the necessaries of life is an institution peculiar to Guise. It has for an object the aiding of the inhabitants of the "Familistère" and their families, even when in full possession of health, when their wages do not attain the minimum necessary for their subsistence. For this purpose a table is drawn up, indicating, according to current prices of the necessaries of life, what is the sum needful for the support of the life of old men, adults and children, and when the sum total of wages received by any family is less than the total of these necessary expenses the association pays the difference. Below are the figures of this table:

	Fr.	c.
Widower or widow, head of a family, per day	1	50
Widow without family	1	0
Man invalided, with a family	1	0
Woman invalided, with a family	0	75
Youths over 16 years, each	1	0
Youths from 14 to 16	0	75
Children from 2 to 14	0	50
Children under 2	0	20

Assurance Against Sickness and Old Age.—A retiring pension is given in the case of entire incapacity for work, without any conditions as to its time or reason. In the case of members and associates it consists of two fifths of their income to the former, and one-third to the latter. With regard to sharers and auxiliaries the retiring pension as follows:

Fr.	c.	
1	0	a day after 15 years' service.
1	50	" " 20 " "
2	0	" " 25 " "
2	50	" " 30 " "

It must be noted that in the case of members, associates and sharers these retiring pensions are added to the interests accruing from the shares held by the parties pensioned off. In any case where incapacity for work the result of an accident met with at work, the pension of a sharer or auxiliary is is reckoned as if for 20 years' service if the injured man has been employed for less than 15 years, and as if for 30 years if he has been a workman for more than 15 years. The two kinds of assurance—namely, pensions and necessaries of life, are supported by, first, a deduction of 2 per cent. from all salaries paid by the association on its general pay list; second, the amounts resulting from the purchase of shares at 50 per cent. reduction, as mentioned above; third, the shares in the profits resulting from the work of the auxiliaries.

Assurance Against Sickness.—This is supported by a subscription of 1 to 1½ per cent. of the wages, by the money received as fines, by the deductions for bad work and by subsidies which the managing committee may order. After six months' regular payment of the subscription the indemnity includes the visits and care of a medical man and a daily payment of twice the monthly subscription for the first three months, one and a half times the monthly subscription for the second three months and once the amount for the last six months, if the member was not 45 years of age on entering the establishment; if he was more, then the daily subsidy is a little less.

IV.—THE "FAMILISTERE."

The "Familistère" is a huge building having a frontage of 180 meters, three stories in hight and forming three enormous blocks of building, inhabited by some 1200 employees of the factory. Two other buildings of less importance, but established on the same principles, hold some 600 people more.

M. Godin terms the whole thing a "Social Palace." The architectural merit of these buildings renders this name fairly well deserved; but from the point of view of the inhabitants, the only term to apply is "barracks." However, the workmen are far from being opposed to this *régime*, and the close intermingling of families which is ordinarily so dangerous is not followed, in this case at least, by the evils which have been attributed to it. The reasons are, we believe, as follows: In the first place, the cheapness, relatively to the rents in the town of Guise; a suite of two rooms and a kitchen costs 9 francs a month; three rooms and a kitchen, 12 francs. This is much dearer than the separate and independent houses let by the mining company of Blanzy at 4.50 francs; by the company of Chatillon at 6 francs, and by the companies of Commentry and Anzin at the same rate; but it is at the same time much cheaper than the cost of accommodation in the town of Guise. Secondly, all the public accessories, such as water and gas services on all landings, refreshment rooms, library, bath-rooms, cisterns, laundry, lavatory, nursery, playgrounds, asylum and schools, are fitted with every convenience, and arranged so as to be within reach of everybody without cost, trouble or loss of time. Then the freedom of the inhabitants is much greater than people imagine. There are no regulations to be observed by occupiers, no fines and not even a *concierge* The "Familistère" has no door—one can enter at any hour of the day or night without any questions being asked without having any to answer; the work

Paris, 1878. *For Superiority.*

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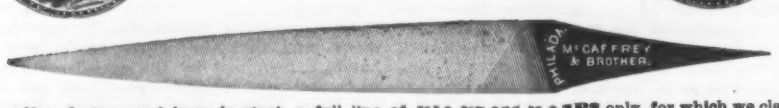

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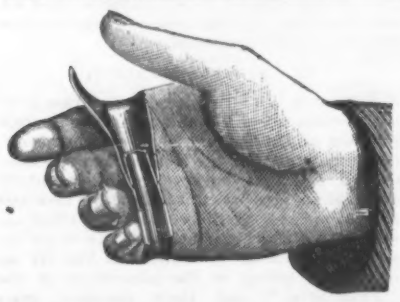

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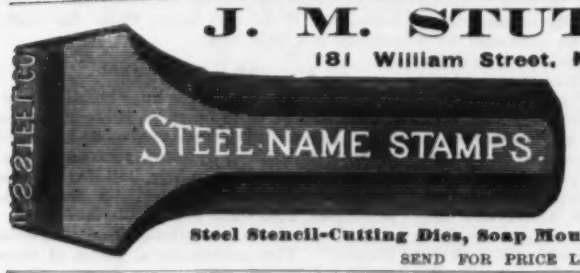

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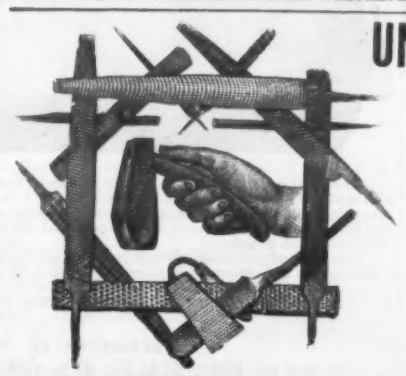

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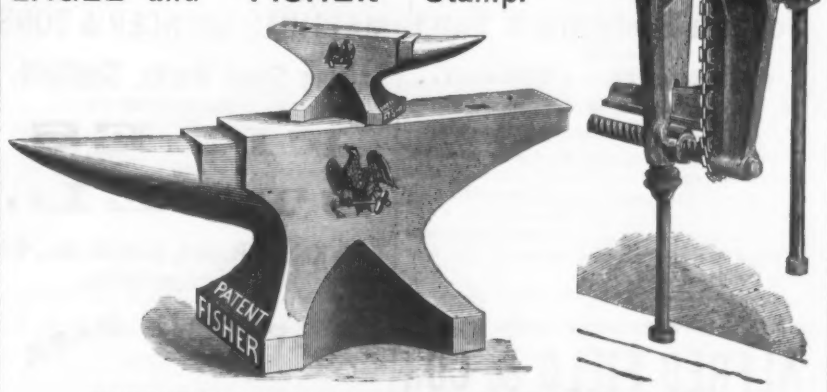

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man is not subjected to any of the regular rules of buildings of the barrack class.

This explains why the workmen appreciate the "Familistère." As to the promiscuous mixing of families, we cannot aver that the dangers usually arising therefrom have no existence whatever. We give, however, some of the arguments by which it is shown that the dangers are not great, even among this mass of people. The first argument is the great pains which are taken to insure cleanliness and light. One of the most ordinary causes of disorder in the common workman's barracks is the greasy and fusty filth of the walls, stairways and lobbies, and the darkness which reigns throughout, and not only affords a shelter to vice, but actually suggests and encourages it. Cleanliness and light are elements of morality, as well as of physical well-being. At Guise there is no obscurity, no filth; stairways, lobbies, are fully lighted; from the first shades of evening a flood of artificial light leaves no corner in darkness. In the second place, the construction of the building is such that everybody is constantly in view of other people. Each division, holding 400 souls, has only one staircase. In consequence, people are coming and going continually, and meetings of two people alone are very rare. On the other hand, the lobbies on which the apartments open on every floor are large balconies, open to the air, running all along the frontage in the court which forms the center of the building. These courts form, as it were, an arena, for which the lobbies serve as galleries. Nobody can enter or leave an apartment without being seen by several people at the time. It is this constant and uninterrupted mutual surveillance which gives to Guise the surest guarantee of morality, and which prevents liberty degenerating into license. That is, at any rate, the statement made on the spot. Disorderly behavior, when any occurs, is followed by fine, and the insertion of the offender's name on a tablet suspended on the wall of each court. Another tablet, a sort of roll of honor, blazons all meritorious actions. In this way public opinion becomes the great regulator of the private conduct of the individual. Those who object to its judgment, free themselves from it by leaving the "Familistère;" those whose conduct is above reproach reside there willingly, for this power of public opinion is their best guarantee of suitable neighbors. It is thus that a rule, everywhere else condemned, produces here, apparently, the happiest results.

V.—RESUME.

On reading the preceding account it is difficult not to feel a certain amount of astonishment. The fact of the purchase of the factory by the society is the more surprising that it immediately recalls to the mind the socialist maxim—"the socialization of the instrument of labor," which is so terrifying a sound in the mouth of the apostles of that doctrine. At the same time the question arises, "Has this M. Godin, then, no family, that he sacrifices in this way his own prospects to benefit an association composed of strangers to him?" That is the first thought which occurs. A moment's reflection will, however, soon modify this view of the question. M. Godin would have sold his factory for 4,600,000 francs to any capitalist or company who would have purchased it. But how could this sale have been arranged. They would have paid M. Godin a part of the price down, and the balance by installments, the unpaid balance bearing interest at 5 per cent. until paid.

Well, what has taken place here? M. Godin has sold his factory to his employees instead of to outside parties. These workmen have already 172,266 francs invested, and he has received this sum of 172,266 francs as a first installment, for it is exactly this which results from the canceling of 172,266 francs' worth of vouchers for savings, and the creation of an equal value in vouchers for shares taken in the society. Then every year M. Godin receives a part of the sale price by the fact of the profits of labor being invested in shares; he also receives the interest due on the unpaid purchase money, and even until the purchasers have entirely paid it off. But that is not all. As he remains managing director, he has an appointment worth 15,000 francs per annum, and, moreover, 12 per cent. of the profits are assigned to him out of the share of profits reserved for management. Finally, he shares in the net profits on account of his labor as an associate, and on account of the capital which he has still invested in the factory.

In point of fact, M. Godin has drawn in the last settlement:

	Francs.	Francs.
1. Interest at 5 per cent. on capital, 3,090,490 francs	154,521	
2. Salary		15,000
3. Share of profits as associate		4,785
4. Share of profits from capital		24,646
5. Share of profits as director		60,387
	154,521	104,818
Total	259,339	

This income of about 260,000 francs (over £16,000) is the personal share of M. Godin. Besides this sum he has received an installment on the sale price of 222,305 francs, made up of the profits arising from labor.

The Earliest Steam Navigation.—A Paris correspondent says that the mania for statue raising is by no means on the decline. To the numerous statues now being got ready for erection all over the land, M. Ferdinand de Lesseps now proposes to add another, in honor of the Marquis de Jouffroy, as the originator of steam navigation. The Academy of Sciences recently named a committee, with the originator of the Suez Canal as its reporter, to specify the part taken by Jouffroy in the important discovery which has revolutionized navigation. The reporter clearly establishes the fact that, if Papin first conceived the idea of applying steam as a motive power in navigation, the practical application of the idea was first realized by Jouffroy, who in 1780, built a boat 140 feet long by 14 feet wide, which steamed up stream on the Saone at a rate of 2 leagues per hour. This was the first *pyroscaph*, and it preceded Fulton's steamboat by full a quarter of a century. The American inventor acknowledged the fact in 1802, in the controversy which arose over the experiments of Desblanc, his words being: "Neither M. Desbanc nor I imagined the *pyroscaph*. If the glory of that discovery belongs to any one it is certainly to the author of the experiments of Lyons, made on the Saone in 1780."

The Exportation of Southern Coal.

Mr. J. W. Burke, with the approbation of the joint committees of the Merchants' Exchange and Cotton Exchange, of Mobile, says the Nashville *American*, has published an exhaustive review of the coal fields of Alabama and the Great Warrior basin, and relation which Mobile bears to them as the great coal port of the future. He notes the fact that in a few years we will be obliged to deal with the problem of supplying the Gulf of Mexico, the West Indies, the Isthmus of Panama, the countries of South and Central America on the Atlantic and Pacific, and the entire Pacific coast, with cheap coal. This trade, already gigantic in its proportions, is now almost entirely absorbed by Great Britain, mainly for the reason that it is delivered at a less price than coal at present mined in the United States, and the control of this enormous trade has remained for years in British hands unchallenged.

Now, the entire coal area of Great Britain is estimated at 11,900 square miles, and the area of the Warrior coal field alone is nearly equal to half that of Great Britain, and, while the latter coal is mined at great depths, that of Alabama is comparatively untouched. In order to show how completely this trade is controlled by Great Britain, the following statement, taken from the statistics of the respective countries, and from the reports of our consuls in those countries to the State Department, is appended. The exportation to these countries is particularly referred to, because they will constitute the nearest and most inevitable market for our Gulf coal in the future:

Bituminous coal imported into	1881. From United States.	1881. From Great Britain.
United States of Colombia	$23,561	$39,000
Mexico	7,326	156,000
British Guiana	....	225,000
Brazil	1,024	948,000
Uruguay	....	350,000
Argentine Republic	....	551,193
Chili	....	427,000
Bolivia	....	30,000
Peru	....	117,000
British West Indies	1,804	207,000
French West Indies	2,400	185,000
Danish West Indies	20,098	127,000
Spanish West Indies	267,541	389,000
Total	$323,698	$3,761,193

The lack of transportation facilities, the expense of mining and delivering at tidewater, together with the local home demand for manufacturing purposes, have restricted the American export trade. But the location of the Alabama coal deposits has less than any other coal deposit these geographical obstacles to contend with. At present all coal mined in Alabama is transported by rail, the internal local demand taking the entire product. Fifty per cent. of its cost of delivery at tidewater is that of transportation.

The Manitoba Farmers.—From a published interview in the Montreal *Herald* with a gentleman who has just returned from Manitoba we take the following: Mr. Tees said that it was his belief that a mechanic could do as well on a farm as any regular farmer. The reason was that it was impossible to farm in the Northwest without machinery. The season was too short and labor too dear. His brother owned a breaking plow for oxen, a sulky plow for horses, a sower, a reaper, a horse-rake and a binder, the latter in partnership with a neighbor. He had also recently joined a company of eleven farmers and purchased a thresher. All these things were needed. In fact, to make farming a success in the Northwest the settler should have sufficient capital to buy this agricultural machinery. There was one source of discontent, however, and that was the high tax on farming implements. The farmers had to buy all their machinery from the United States, and were grumbling a good deal at having to pay 35 per cent. duty. On the route by Rapid City to Brandon the railway was doing wonders—opening up the country and bringing the farmer's goods to his own door. Mr. Tees said that when his brother first settled on his farm he was 60 miles from a station, now he was only 4 miles. The railway was opening up the country in every direction.

Dry-Rot in Timber.—Aemedreseyhba n discovered, says the *Mechanical World*, by the use of which this destructive enemy to the woodwork of a house may be destroyed or arrested. What is known as "dry-rot" is caused by the spores of a species of fungus (the *Merulius lacrymans*), which, though they are sometimes carried by currents of air to the scene of their future devastations, are more frequently present in the soil upon which the house is built at the time of erection, and are brought into near contact with the woodwork in the filling up between the joists, or sometimes even in the mortar. Notwithstanding its name, dry-rot does not act upon perfectly dry timber, but begins its ravages whenever the wood is in the necessary state of humidity. It may be prevented by mixing with the rubbish used for filling in the floors the "tank waste" from alkali works, or the same substance will completely check it if already developed. Tank waste is of no commercial value, and may be had at alkali works for fetching; it wholly destroys this species of vegetable life, and generates no bad smell whatever.

We are not only the greatest agricultural nation on earth, but, according to "Mulhall's Dictionary of Statistics," an English work, we lead also in manufactures. Mulhall places the value of British manufactures in 1880 at $4,015,500,000, and of the United States products of manufacture during the same year at $5,500,000,000.

"I do hereby give and bequeath to my sister, Elizabeth Schaffer, all my real and personal property of whatever description," was the wording of the will by which the late president of the Macungie Iron Company, W. L. Schaffer, disposed of his $1,000,000 estate.

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NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson to sue me for damages for the wrong aforesaid, I do hereby undertake and agree,

FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and

SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1883.

WITNESS:—
E. M. REED."
(Attorney for Defendant.)

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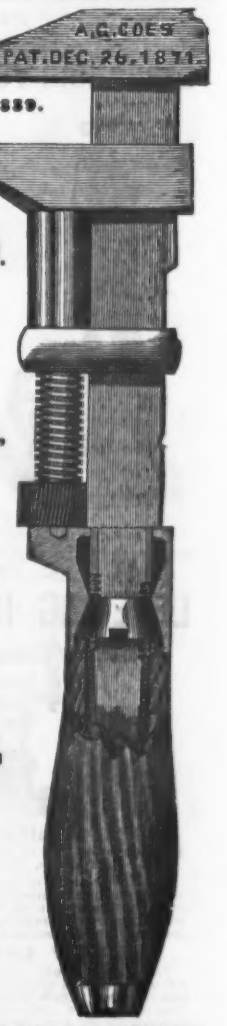

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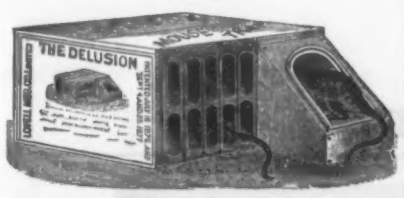

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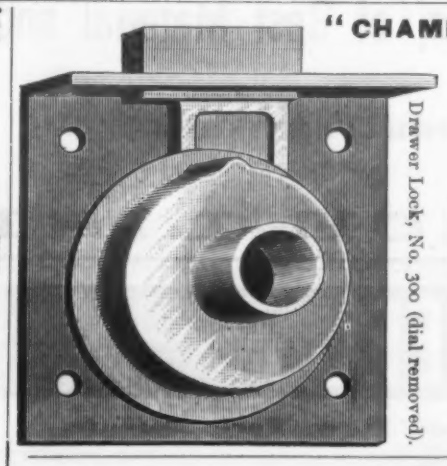

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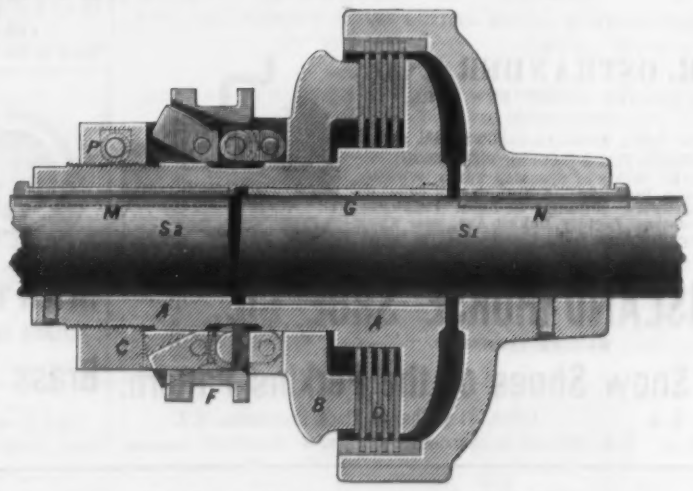

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Pyrometers.

Mr. W. R. Browne, writing in *Nature*, gives an interesting historical sketch of the advances made in pyrometry :

The accurate measurement of very high temperatures, he observes, is a matter of great importance, especially with regard to metallurgical operations ; but it is also one of great difficulty. Until recent years the only methods suggested were to measure the expansion of a given fluid of gas, as in the air pyrometer ; or to measure the contraction of a cone of hard, burnt clay, as in the Wedgewood pyrometer. Neither of these systems were at all reliable or satisfactory. Lately, however, other principles have been introduced with considerable success, and the matter is of so much interest, not only to the practical manufacturer, but also to the physicist, that a sketch of the chief systems now in use will probably be acceptable. He will thus thus be enabled to select the instrument best suited for the particular purpose he may have in view.

The first real improvement in this direction, as in so many others, is due to the genius of Sir William Siemens. His first attempt was a calorimetric pyrometer, in which a mass of copper at the temperature required to be known is thrown into the water of a calorimeter, and the heat it has absorbed thus determined. This method, however, is not very reliable, and was superseded by his well-known electric pyrometer. This rests on the principle that the electric resistance of metal conductors increases with the temperature. In the case of platinum, the metal chosen for the purpose, this increase up to 1500° C. is very nearly in the exact proportion of the rise of temperature. The principle is applied in the following manner : A cylinder of fire-clay slides in a metal tube, and has two platinum wires $\frac{1}{100}$ inch in diameter wound round it in separate grooves. Their ends are connected at the top to two conductors, which pass down inside the tube and end in a fire-clay plug at the bottom. The other ends of the wires are connected with a small platinum coil, which is kept at a constant resistance. A third conductor starting from the top of the tube passes down through it and comes out at the face of the metal plug. The tube is inserted in the medium whose temperature is to be found, and the electric resistance of the coil is measured by a differential voltameter. From this it is easy to deduce the temperature to which the platinum has been raised. This pyrometer is probably the most widely used at the present time.

Tremeschini's pyrometer is based on a different principle, viz., on the expansion of a thin plate of platinum, which is heated by a mass of metal previously raised to the temperature of the medium. The exact arrangements are difficult to describe without the aid of drawings, but the result is to measure the difference of temperature between the medium to be tested and the atmosphere at the position of the instrument. The whole apparatus is simple, compact, and easy to manage, and its indications appear to be correct, at least up to 800° C.

The Trampler pyrometer is based upon the difference in the coefficients of dilatation for iron and graphite, that of the latter being about two-thirds that of the former. There is an iron tube containing a stick of hard graphite. This is placed in the medium to be examined, and both lengthen under the heat, but the iron the most of the two. At the top of the stick of graphite is a metal cap carrying a knife-edge, on which rests a bent lever pressed down upon it by a light spring. A fine chain attached to the long arm of this lever is wound upon a small pulley ; a larger pulley on the same axis has wound upon it a second chain, which actuates a third pulley on the axis of the indicating needle. In this way the relative dilatation of the graphite is sufficiently magnified to be easily visible.

A somewhat similar instrument is the Gauntlett pyrometer, which is largely used in the north of England. Here the instrument is partly of iron, partly of fire-clay, and the difference in the expansion of the two materials is caused to act by a system of springs upon a needle revolving upon a dial.

The Ducomet pyrometer is on a very different principle, and only applicable to rough determinations. It consists of a series of rings made of alloys which have slightly different melting points. These are strung upon a rod, which is pushed into the medium to be measured, and are pressed together by a spiral spring. As soon as any one of the rings begins to soften under the heat, it is squeezed together by the pressure, and. as it melts, it is completely squeezed out and disappears. The rod is then made to rise by the thickness of the melted ring, and a simple apparatus shows at any moment the number of rings which have melted, and therefore the temperature which has been attained. This instrument cannot be used to follow variations of temperature, but indicates clearly the moment when a particuiar temperature is attained. It is, of course, entirely dependent on the accuracy with which the melting points of the various alloys have been fixed.

Yet another principle is involved in the instrument called the "thalpotasimeter," which may be used either with ether, water or mercury. It is based on the principle that the pressure of any saturated vapor corresponds to its temperature. The instrument consists of a tube of metal partly filled with liquid, which is exposed to the medium which is to be measured. A metallic pressure gauge is connected with the tube and indicates the pressure existing within it at any moment. By graduating the face of the guage when the instrument is at known temperatures the temperature can be read off directly from the position of the needle. From 100° to 220° F. ether is the liquid used ; from thence to 680° it is water, and above the latter temperature mercury is employed.

Another class of pyrometers having great promise in the future is based on what may be called the "water-current" principle. Here the temperature is determined by noting the amount of heat communicated to a known current of water circulating in the medium to be observed. The idea, which was due to M. de Saintignon, has been carried out in its most improved form by M. Boulier. Here the pyrometer itself consists of a set of tubes, one inside the other, and all inclosed for safety in a large tube of fire-clay. The central tube or pipe brings in the water from a tank above, where it is maintained at a constant level. The water descends to the bottom of the instrument and opens into the end of another small tube called the explorer (*explorateur*). This tube projects from the fire-clay casing into the medium to be examined, and can be pushed in or out as required. After circulating through this tube the water rises again in the annular space between the central pipe and the second pipe.

The similar space between the second pipe and the third pipe is always filled by another and much larger current of water, which keeps the interior cool. The result is that no loss of heat is possible in the instrument, and the water in the central tube merely takes up just so much heat as is conducted into it through the metal of the explorer. This heat it brings back through a short india-rubber pipe to a casing containing a thermometer. This thermometer is immersed in the returning current of water and records its temperature. It is graduated by immersing the instrument in known and constant temperatures, and thus the graduations on the thermometer give at once the temperature, not of the current of water, but of the medium from which it has received its heat. In order to render the instrument perfectly reliable, all that is necessary is that the current of water should be always perfectly uniform, and this is easily attained by fixing the size of the outlet once for all, and also the level of water in the tank. So arranged, the pyrometer works with great regularity, indicating the least variations of temperature, requiring no sort of attention, and never suffering injury under the most intense heat; in fact, the tube, when withdrawn from the furnace, is found to be merely warm. If there is any risk of the instrument getting broken from fall of materials or other causes it may be fitted with an ingenious self-acting apparatus shutting off the supply. For this purpose the water which has passed the thermometer is made to fall into a funnel hung on the longer arm of a balanced lever. With an ordinary flow the water stands at a certain hight in the funnel, and while this is so the lever remains balanced ; but if from any accident the flow is diminished, the level of the water in the funnel descends, the other arm of the lever falls, and in doing so releases two springs, one of which in flying up rings a bell, and the other, by detaching a counterweight, closes a cock and stops the supply of water altogether.

It will be seen that these instruments are not adapted for shifting about from place to place in order to observe different temperatures, but rather for following the variations of temperature at one and the same place. For many purposes this is of great importance. They have been used with great success in porcelain furnaces, both at the famous manufactories at Sèvres and at another porcelain works in Limoges. From both these establishments very favorable reports as to their working have been received.

Proposed American Asiatic Railway.

A recent issue of the *Railway World* publishes the following account of Major W. H. Kent's project for a railway from the United States to Asia via Behring's Strait :

The proposed western terminus of the Canadian Pacific was Fort Simpson, in latitude 54.40, and near the southern boundary of Alaska, the latter universally and erroneously believed to be a land of ice and snow and eternal winter. By following up the trend of the coast to Mount St. Elias, 525 miles, and thence across the main body of the territory to Behring Strait, 1000 miles more, the route would lead through the Aleut and Yukon districts, the best portion of the old Russian territory. Maps, charts, official records and old Russian histories were secured and carefully studied, and these, with personal evidence and private letters, all proved that the country to be passed through had the climate of Scotland in the summer, and of New Jersey in the winter, Alaska possesses forests equaled only by those of Central Africa, stores of the precious metals which will surpass those of California in her palmiest days, the grandest fisheries in the world, a magnificent fur country, and rich deposits of coal, copper and other of earth's treasures, besides being adapted for grazing and wheat-raising.

Behring's Strait has an average width of 36 miles, but at its narrowest point is a cluster of small islands, the Diomede group, standing like sentinels at the gateway between the sunny Pacific and the frozen seas of the north. Here the strait is comparatively free from ice the year round, the water is shallow and furnishes good anchorage for vessels, and the widest space between any two points of land between the islands and the two continents is only a mile and a half. Kent claims that this strait can be easily traversed the year round by transfer boats, and also that a tunnel is practicable within a reasonable limit of expense. Crossing the strait is one of the least difficult steps in the proposed line. From Cape East, on the Asiatic side, the coast would be hugged as close as the conformity of the country would permit in order to obtain the benefit of the milder temperature, which here, as in Alaska, is caused by the Kuri Siwo, or Japanese current, similar to the Gulf Stream, but larger. The southern terminus of the road would be at Vladiovski, an important port on the Russian frontier, near the mouth of the Amoor. This section of the line would be longer than that through Alaska, but a large portion of it would traverse a country declared to have the climate of Italy, thanks to the Japanese current. At the southern terminus a junction would be made with the the Russian system of railroads now pushing down the old caravan route toward Irkutsk, the capital of Siberia. At the point of proposed junction Russia spent $3,000,000 last year in colonizing the province roundabout. When the Russian and American extremities of the line meet it would form a continuous line from Boston to London or Liverpool.

Kent claims that there are no climatic or other natural obstacles to interfere with the building and continuous operation of such a road, and that it will certainly be built some time in the future. The necessity of commerce and Transcontinental communication

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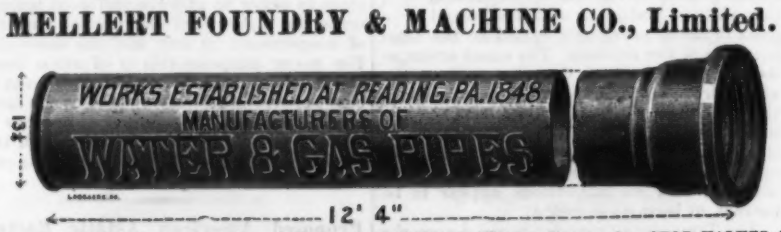

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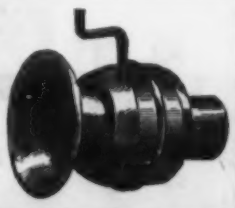

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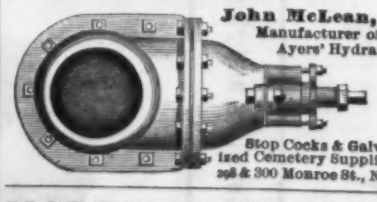

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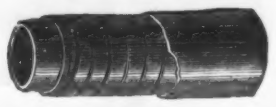

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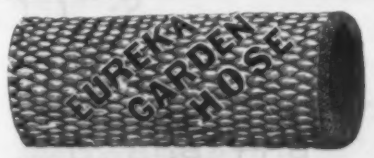

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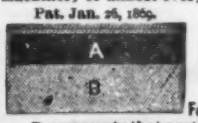

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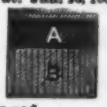

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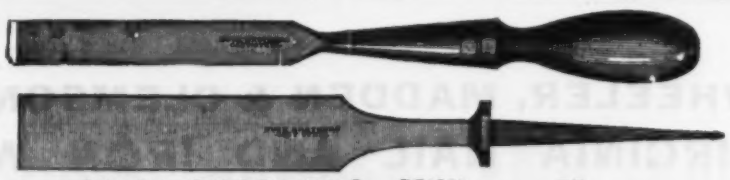

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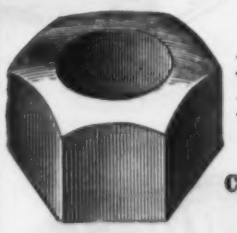

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SCIENTIFIC AND TECHNICAL.

A South American Saltpeter Bed.

To the eastward of Cocha-bamba, in Bolivia, South America, says an exchange, an immense saline deposit has been discovered near the village of Aranê. Analyzed by M. Sacc, the ingredients are potassic nitrate, 60.70; borax, and traces of salt and water, 30.70; organic matter, 8.60 per cent. On dissolving this mixture in boiling water and cooling it, a plentiful crystallization of pure saltpeter is obtained. The soil on which the bed lies is brown and inodorous when it is dry, but when moistened it gives out an odor of carbonate and sulphhydrate of ammonia. M. Sacc has found it composed of incombustible residue, 74.20; borax and salts, 15.50; and organic matter with water and ammoniacal salts, 10.30 per cent. The incombustible residue is formed of a very fine sand, and of phosphate of lime, magnesia and iron in large proportion. The saltpeter has evidently originated from the oxidation of the ammoniacal salts of the soil in presence of potash and soda produced by the slow decomposition of the schists on which they rest. The potassic nitrate has mounted by capillarity to the surface of the soil, while the diliquescent nitrate of soda has been drawn by the rains toward the dry and warm regions of the coast, where it forms the beds of nitrate of soda actually worked in Chili. As immense quantities of fossil bones are found in the soil around Aranê, it is possible that the saltpeter beds there, which are capable of supplying the whole world, are a result of the decomposition of a vast deposit of antediluvian animal remains.

A Red Lunar Halo.

A magnificent lunar halo of a red hue was observed at Rome by M. Tacchini, on July 4, at 9.30 p. m. The moon itself showed of a reddish hue, and was surrounded by a reddish aureole, of a width rather more than the diameter of the moon. The tint was nearly that of bright pure copper. The moon at the time was nearly 30° high, and the phenomenon was seen till 10 o'clock. On July 5 the same phenomenon was visible, but more feeble; on the 6th the sky was clouded. Afterward the phenomenon was no longer seen. During the nights of the 4th, 5th and 6th the atmosphere was excessively humid from 9 p. m. to 6 a. m. of the following mornings. The saturation during these intervals was almost complete, whereas, during the day, the humidity fell to 0.40.

Balloon Experiments in France.

On Saturday, August 9, M. Renard, captain of engineers, and M. Krebs, captain of infantry, says *Nature*, made an experiment with the directing balloon which they are constructing at the expense of the French Government in the aëronautical works of Chalet Meudon. The balloon, which is about 60 meters (196.8 feet) in length and 10 meters (32.8 feet) in diameter, carries a long platform of about 40 meters (131.2 feet) in length and 3 meters (10.4 feet) in breadth. At one of its extremities sit the aëronauts in a car. The aërial helix and a Gramme magneto-electric machine are placed at the other. The voltaic elements and ballast are disposed on the platform. The wind not being strong, the aëronauts ascended and tried first the effect of their rudder, which is a sail of about 10 meters square. The results were very satisfactory indeed, and the steering of the balloon remarkable quick and easy. The balloon was drifted by the wind from Chalet Meudon to Petit Bicetre, above the Meudon woods. Then the aëronauts, wishing to return home, adjusted the rudder and the experiment succeeded wonderfully; in five minutes the distance, which is about 2 miles, was run. The balloon landed just before the doorway of its wooden house. This experiment will be tried again in a few days for a longer distance. The system practiced by the French officers is a slight modification of the one used by Gaston Tissandier. The French officers were originally adherents of the helix moving round an axis traversing the balloon, but the result of the experiments published by Tissandier seems to have modified their opinion.

Tempered Glass.

It is not very long, says the *Glassware Reporter*, since the discovery of M. Alfred de la Bastie filled all our newspapers with paragraphs, more or less ridiculous, about the properties of this glass. Some claimed it was malleable; others that it could not be broken. In fact, tempered glass was called upon to supersede all other materials. The excitement being over, tempered glass may now take its rank among valuable inventions, subject, however, to many defects in its present state. The process of tempering glass, as is well known, consists in heating a piece of glass, say a window pane, to such a degree as to approach malleability, but not hot enough to lose its shape; the glass in this state is instantly plunged into a bath composed of fatty and resinous matter, which is heated and maintained liquid at a temperature ranging from 300° to 600°, according to the quality of the glass. The difference of temperature between the malleable state, about 1400°, and that of the bath constitutes the temper. Until the discovery of tempered glass by M. de la Bastie, it had always been considered that, unless a lamp-chimney or any other piece of glass was perfectly annealed, differences of temperature brought on suddenly would invariably cause a breakage. The Bastie glass would seem to prove this view to be erroneous, as the tempered glass can sustain sudden and extreme changes of temperature without breaking. Molten lead has been poured into a glass bowl or tumbler without producing a fracture. A piece of plate-glass tempered by the Bastie process, having been heated among coals, was suddenly plunged into cold water without producing any effect. This experiment, repeated five times in succession, did not seem to impair the qualities of the glass, for on dropping it from a fifth-story window it did not break. It may be said, however, that if in the heating the temperature should reach the point at which it would be annealed, the temper would be destroyed. This action does not seem to take place when the period of heating is not continued too long. A plate of glass 6¼ x 4¾ inches and ⅛ inch thick could only be broken under the shock of a weight of 7 ounces falling 13 feet, while an ordinary piece of glass of the same dimensions would break under half of that weight falling about 16 inches. M. Siemens, of Dresden, says that the strength of glass is increased 50 times by being tempered. A bent plate of glass laid upon the floor with the convex side upward is capable of resisting the weight of an ordinary-sized man without breaking. The glass while subjected to the weight will flatten out, but as soon as the pressure is removed it will spring back at once to its original shape. Hardened glass seems to be less dense than ordinary glass; it is harder, however, and is more difficult to cut by the diamond and tempered tools; it also possesses a much superior elasticity over the ordinary glass. Since tempered glass, however, cannot be cut with the diamond without flying to pieces, its use must necessarily be limited to definite sizes not requiring to be modified; this is quite a drawback to its use. It would seem, however, that some of the defects have already been overcome, for at the Paris Exposition quite a display of tempered goods was made by the "Société Anonyme du Verre Trempé," of Paris. Among other things was quite a display of druggists' and chemical glassware, mortars, pestles, beakers, covered bowls, funnels; also a variety of plain and cut-glass tumblers, goblets, decanters, globes and chimneys, opal plates, a depolished bowl with cut facets, colored glass, engraved, cut, &c. It is said that the making of articles varying in thickness is hazardous, as many of them are apt to fly to pieces either in the making or cutting.

Explorations About Krakatoa.

Messrs. Cotteau and Korthalls, members of the French mission sent by the Minister of Public Instruction to explore the Krakatoa volcano, write from Batavia on June 2 that the object of the expedition has been fully realized. Soon after their arrival at Batavia, on May 14, the Dutch Colonial Government placed at their disposal a small steamer, on board of which they started for the Sunda Strait on the 21st. Along the west coast a well-marked line, running at an elevation of from 50 to 80 feet above sea level, indicated the limit reached by the terrible wave that spread disaster far and wide toward the end of August, 1883. The plantations had been swept away, and all the houses of this populous district, together with the town of Anjer, had completely disappeared. On the 23d the steamer cast anchor at the head of Lampong Bay, on the south coast of Sumatra, whence a visit was paid to the Telok-Betong district. Here the extensive and thickly-settled coastlands had assumed the aspect of a desolate swamp, relieved here and there by a few bamboo huts recently set up. Nearly 3 miles inland lay the steamer Borouw, which had been borne on the crest or the wave into the forest, where it now forms a sort of bridge across a small stream. On the 25th the formerly fertile and densely-peopled islands of Sibuka and Sibesi were successively visited, and found to be entirely covered by a deposit of dry mud several yards thick and furrowed by deep crevasses. Of the inhabitants, all had perished to a man. Continuing the trip on the 26th to Krakatoa itself, the mission was surprised to note the complete disappearance of the three islands of Steers, Calmeyer and the islet east of Verlaten, which had risen above the surface at the time of the eruption, but which are now covered by 12 or 14 feet of water. Approached from the north, Krakatoa seemed wrapped in a whitish smoke, vapors apparently issuing from fissures on this side, and settling on the summit, which is at present 2730 feet high. It was at this point that the great convulsion took place on August 26–27, when about half the isalnd was blown into the air. A closer examination showed that what had been taken for fissures were simply ravines, and the vapors were clouds of dust stirred up by stones incessantly rolling down the steep slope of the mountain. This was accompanied by a continuous noise like the rattling of distant musketry, while stones of a certain size were seen whirling in the air, then falling and riochetting down to the sea. Notwithstanding the evident danger, the boats of the expedition succeeded in approaching the foot of the volcano and collecting specimens of the rocks at several points. The same afternoon they reached the island of Verlaten, formerly one mass of verdure, now uniformly covered with a layer of solidified ashes about 100 feet thick. The deep crevasses, widened by the erosion of tropical rains, give the aspect of a glacier to this island, which has been doubled in extent by the deposits from the last eruption. Returning next day to Krakatoa, the members of the expedition found a safe landing place, where it was possible to study the nature of the rocks and other matter ejected by the volcano. No trace was found of animal or vegetable life with the exception of a solitary little spider, and the solidified bed of mud and ashes was estimated in some places to have attained a thickness of from 200 to 260 feet. A black rock rising a few yards above the surface, about a mile and a quarter from the present shore, represents a last fragment of the portion of the island engulfed during the eruption. After touching at Lang Island, which presented much the same appearance as its neighbor, Verlaten, the expedition concluded its survey of the strait, landing on the 28th at Merak, at the northwest extremity of Java. Merak had shared the fate of Anjer, and the coast line in this district had been considerably modified. The expedition returned to Batavia on the 29th, after de-

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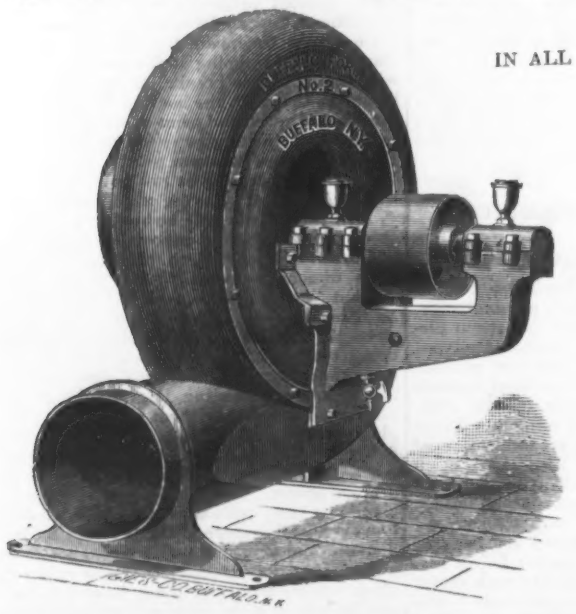

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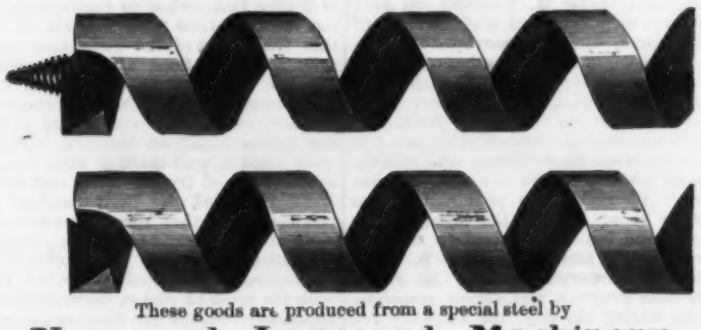

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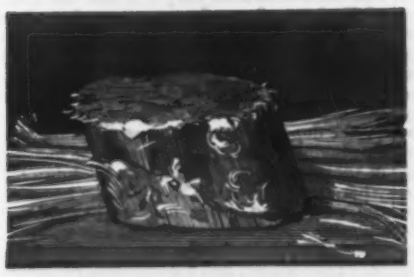

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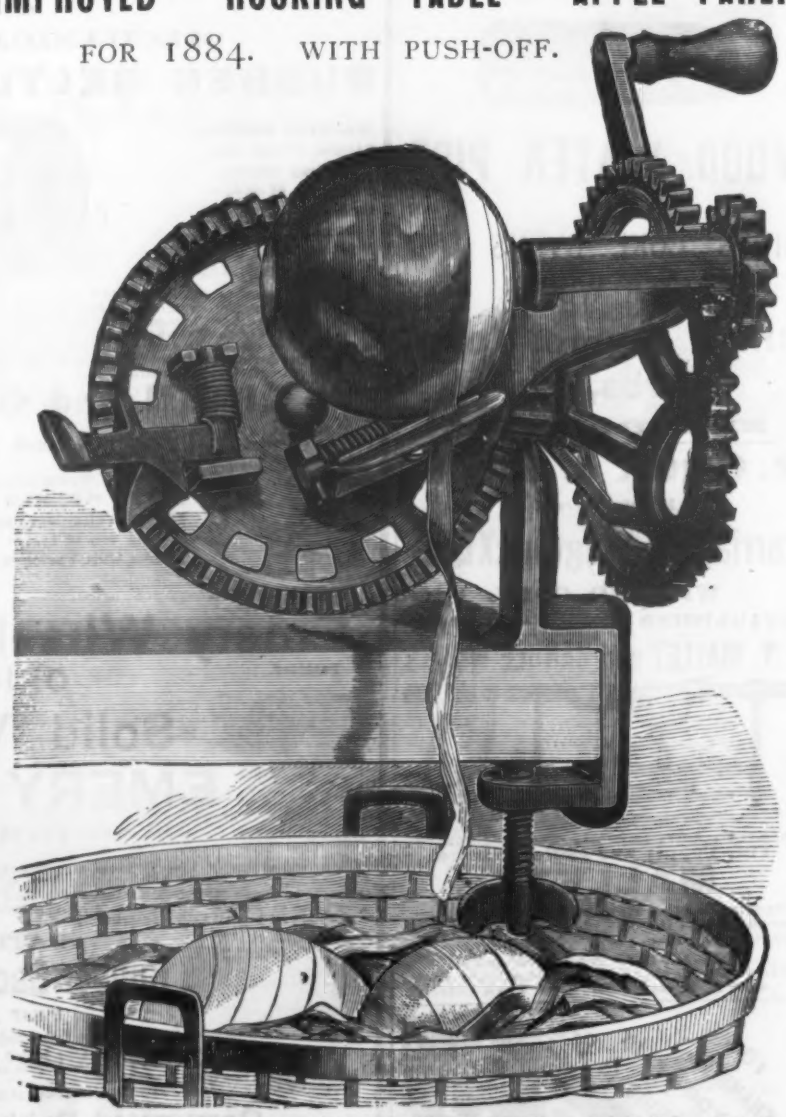

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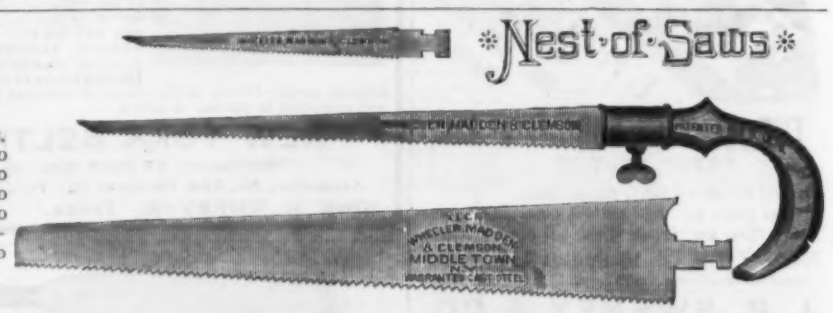

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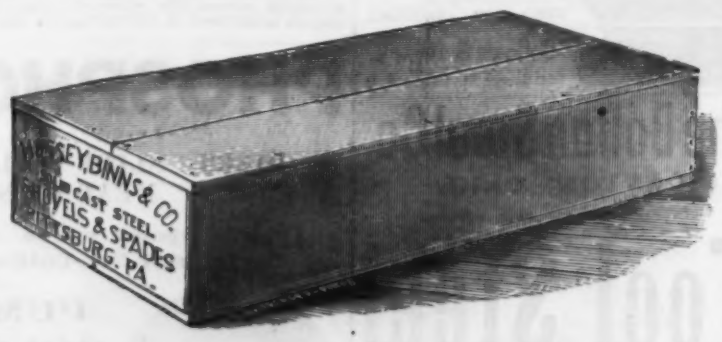

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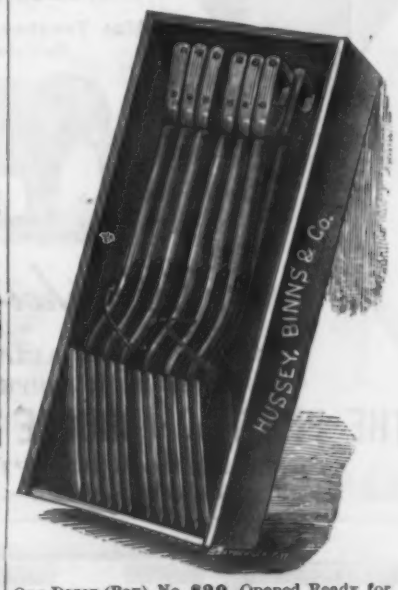

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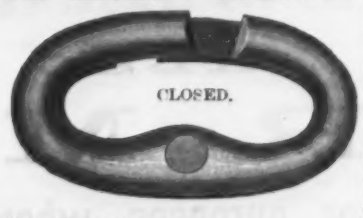

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termining two new facts—the disappearance of the islands upheaving during the eruption, and the total cessation for the present of all volcanic activity at Krakatoa.

The Dowlais Iron Works.

The following description of the Dowlais Works we reprint from a recent number of *Engineering:*

These extensive works were founded nearly 140 years ago, and are in many respects noteworthy as having been connected with several important epochs in the iron and steel industry of South Wales. Here the first steel rail ever made was rolled, the mill from which it was turned out being in active work at the present time. Dowlais is also historically interesting as having been connected with the earliest history of the locomotive. The works, which are scattered over a vast area of ground, are at present on the eve of many and great changes, which will have the effect of transforming the whole aspect of the place, so that what might be said of it to-day will probably be incorrect a year or two hence.

Commencing at the southern end of the premises, we take the steel works first. There are three Bessemer pits, each of which has two 8-ton converters of the usual type, with ordinary rack and pinion tipping arrangement. Those known as Nos. 2 and 3 are in use at present, and are being worked with 10-ton charges. The pits are served by the usual single-ram hydraulic central crane and two balanced ingot cranes. The ladle, with the metal, is brought in from furnaces at back of the converters, at a level somewhat above that of the pits. From thence it is raised to a higher level by a hydraulic lift. This brings it sufficiently high to enable the metal to be tapped out, and it is then run into the converters by swinging troughs in the usual way. A short line of rails runs at the back of the converters, so that the ladle can be traversed from one to another. There are two cupolas at the back of each pit used for spiegel. They are placed sufficiently high for the spiegel to be tapped out at a level which will enable it to flow into the converters through the trough used for the charge from the furnace. The materials used for charging the cupolas are raised by a hydraulic lift. The converter bottoms are made and dried immediately at the back of the pits, the drying stoves, which have a line of rails running between them, being arranged so that the bottom goes in on a truck at one side and comes out at the other, close to the converter. A small crane is placed on the top of the stove for lifting the bottom on to the truck, and a special crane is provided for placing the bottoms in the converter. There are four cupolas for melting pig when required. Two hydraulic lifts are provided for working these.

For blowing the converters there is a pair of horizontal engines by Messrs. Hicks, Hargreaves & Co., having 36-inch steam cylinders and 48-inch air cylinders, the stroke being 5 feet. These are the original engines erected in this part of the works for steel-making, and in addition to them there is a pair of vertical engines by Messrs. D. Adamson & Co., with 40-inch steam cylinders, 54-inch air cylinders and a stroke of 5 feet. The hydraulic machinery for both the Bessemer and Siemens plant is situated in the same building. It consists of four pairs of pumping engines, viz., a pair of 10 x 12 inches, a pair of 12 x 24 inches, a pair of 16 x 24 inches and a pair of 14 x 30 inches engines. Near them there is also a blowing engine of the beam type with a 36-inch steam cylinder and a 7-foot stroke, which is used for blowing converters when they are being warmed. There are also three No. 7 Roots blowers for serving the cupolas. Steam is supplied by 19 single and double flue boilers, which are coal-fired and were made on the premises. There are six Siemens-Martin steel furnaces which will take respectively 6, 7 and 8 ton charges. Two of these furnaces are provided for each pit, the latter being arranged in the same way as with the Bessemer plant.

Between Nos. 2 and 3 pits is a small foundry where castings are made direct from the furnaces. The ingots are taken hot from the molds to the cogging mills, by means of iron trolleys which held about six or eight ingots each, and are drawn by horses. The original cogging-mill engine is by Messrs. Kitson & Co., of Leeds. It is geared four to one, and has two cylinders, each 30 inches in diameter by 4-foot stroke. The steam pressure is 50 pounds. The rolls are 36 inches between centers, the top rolls being movable. The blooms are sheared into lengths by a pair of horizontal sliding shears, and then lifted by a hydraulic crane on to bogies, to be taken by trucks to the rolling mill. The second cogging mill is placed at the extremity of the range of buildings comprised in this part of the steel works. The rolls are 36 inches in diameter, and have a movable top roll, as before mentioned, and the arrangement generally is as described in the first train. They are driven by a double pair of compound horizontal tandem engines by Messrs. Kitson & Co., of Leeds. These are fitted with piston-valves, and have cylinders 24 inches and 43 inches diameter, the stroke being 4 feet. They are geared three to one and run with a boiler pressure of 80 pounds. The live rollers to this train are placed very close together, and are driven by a continuous train of spur-wheel gearing. There are attached to this plant four heating furnaces fired by gas, and 13 in which coal is used; most of these have steam boilers attached. For serving all the furnaces four blocks of gas-producers, each block having 12 fires, are provided.

From the cogging mills we pass to the rail mills, which have a train with 25-inch centers. It is driven by a pair of horizontal engines by Messrs. Kitson & Co., with cylinders 48 inches in diameter by 4 feet 6 inches stroke. The engines are coupled direct to the rolls. Here there are 10 heating furnaces, all coal-fired; the blooms are drawn from them by hydraulic power. From the mill train the rails are carried in the usual way to a swinging circular saw and then to the straightening presses. In this neighborhood are eight rail-ending machines, driven by separate engines, for the purpose of cutting rails to exact lengths. In an adjoining shed are eight horizontal rail drills driven by a semi-portable engine.

A new rail mill is being laid down in this part of the works, and the engines, which are by Messrs. Kitson & Co., are partly erected. They have 60-inch cylinders and 5-foot stroke, and will be coupled direct to a 25-inch train. These engines have piston-valves, the axes of the valve and of the main cylinder of each engine respectively lying in two planes inclined toward each other. The eccentrics are mounted on a length of shafting carried by brackets raised to the required hight above the engine framing, this shaft being driven from the main shaft by helical spur gearing. The arrangement affords an excellent means of economizing space. The reversing in this, as in the other engines, is effected by hydraulic power. In the center of this mill there stands an old beam engine which ran the plant for many years.

Passing from the steel works to the furnaces, we find that in the principal part of the works there are now six in blast, while in the Ivor Iron Works, which belongs to the establishment, there are four other furnaces, one having been blown out. These blast furnaces are of various sizes, between 50 and 70 feet. The one known as No. 1 is of the cylindrical type, 65 feet high, and is hooped with iron bands. The diameter of the bosh is 17 feet 6 inches; the hearth is 7 feet 6 inches, and the throat 12 feet 6 inches. There are attached to this furnace three Cowper stoves 22 feet in diameter and 60 feet high, two serving the furnace while the third is being heated. Close to this a new furnace of a similar style and of the same diameter, but 10 feet higher, is being erected. Another furnace, known as No. 9, is of the same dimensions as the first named, and has the blast heated by three Whitwell stoves, two being on blast while the third is being heated. Other furnaces of smaller dimensions and fitted with pipe stoves are also in blast. The blowing engines are placed in various buildings situated in this part of the premises. The first is of the ordinary beam type, having a steam cylinder 55 inches in diameter and a stroke of 13 feet, the air cylinder being 144 inches in diameter and 12-foot stroke. It has a common slide-valve with a cut-off-valve working on a separate facing on the valve-chest. Engines Nos. 2 and 3 are in another house close by. They are also of the beam type and work independently of each other. The steam cylinders are 60 inches in diameter with a stroke of 10 feet, the air cylinders being 132 inches in diameter and the stroke 9 feet. For these three engines a steam pressure of 50 pounds is used. No. 4 is an old low-pressure condensing beam engine with double-beat-valves worked by tappet gear. The steam cylinder is 60 inches, the air cylinder 96 inches, and the stroke 8 feet. No. 5 is a compound non-condensing beam engine with cylinders 42 and 60 inches in diameter; the air cylinder is 144 inches. The stroke is 10 feet and the boiler pressure 50 pounds. No. 6 is a beam engine with a 45-inch steam cylinder and a 104-inch air cylinder, the stroke being 9 feet.

These engines were not all at work on the occasion of our visit, but they all deliver into one main, the pressure of blast being about 3½ pounds. They are principally driven by boilers fired by the waste gases from the furnaces and coke ovens, only comparatively a small quantity of coal being burnt for raising steam. On the high ground at the back of the furnaces the depot is situated. The materials are raised the additional hight of the more modern furnaces by steam hoists with directly-connected overhead cylinders.

There are extensive ranges of coke ovens, of the ordinary South Wales type, situated on the high ground at the back of the furnaces, and, in addition to these, there are two blocks, each containing 36 Coppée ovens. These are served by two steam "pushers out" of the usual type.

The coal-washing machinery in this part of the works has recently been fitted up by Erence Coppée, of Brussels. It is run by a horizontal engine with a 30-inch cylinder and a stroke of 5 feet. We believe that the special feature about it is that bituminous coal and harder varieties can be treated at one operation.

The iron works to which we have made reference are situated to the north of the premises we have been describing. Here, we understand, there are four furnaces in blast and one out. One of these furnaces is 65 feet high, and is served by Whitwell stoves, the other stoves being of the old cast-iron pipe description. There are two blowing engines. One has a steam cylinder 52 inches in diameter, the air cylinder being 144 inches, and the stroke 9 feet. The second is a horizontal engine, and has a steam cylinder 52 inches in diameter, an air cylinder 108 inches, and a stroke of 9 feet. The boilers supplying steam are heated partly by the furnace gases. These furnaces are making iron for the rolling mills. Here are two puddling forges and one plate mill, together with guide and merchant bar mills. It should be mentioned, also, that puddling is carried on in the part of the works first described, where there are also two merchant bar mills. We have not attempted to give any details of the various engineering shops which are used for doing the work required on this large establishment. In fact, it seems a work of questionable utility putting on record much that is likely so soon to be altered or added to.

A Spoiled Tin Roof.—A curious suit was recently decided in Philadelphia, which is thus described in one of the papers published in that city: Richard C. Dale, the referee in the suit of the Philadelphia and Gray's Ferry Passenger Railway Company against Harrison Bros. & Co., the proprietors of the Chemical Works on Gray's Ferry road, recently filed his report in court. The tin roofs covering the stable, car-house and office of the company, which adjoins the defendants' works on the west, were, it was alleged, much injured by acid falling upon them, and the referee finds this to be the fact. He says that the evidence showed that nitric acid, which came from the works in small quantities, was deposited on the roofs and in time eat them away. Mr. Dale finds the damage to be $1600, but he also says that ammonia from the company's dung

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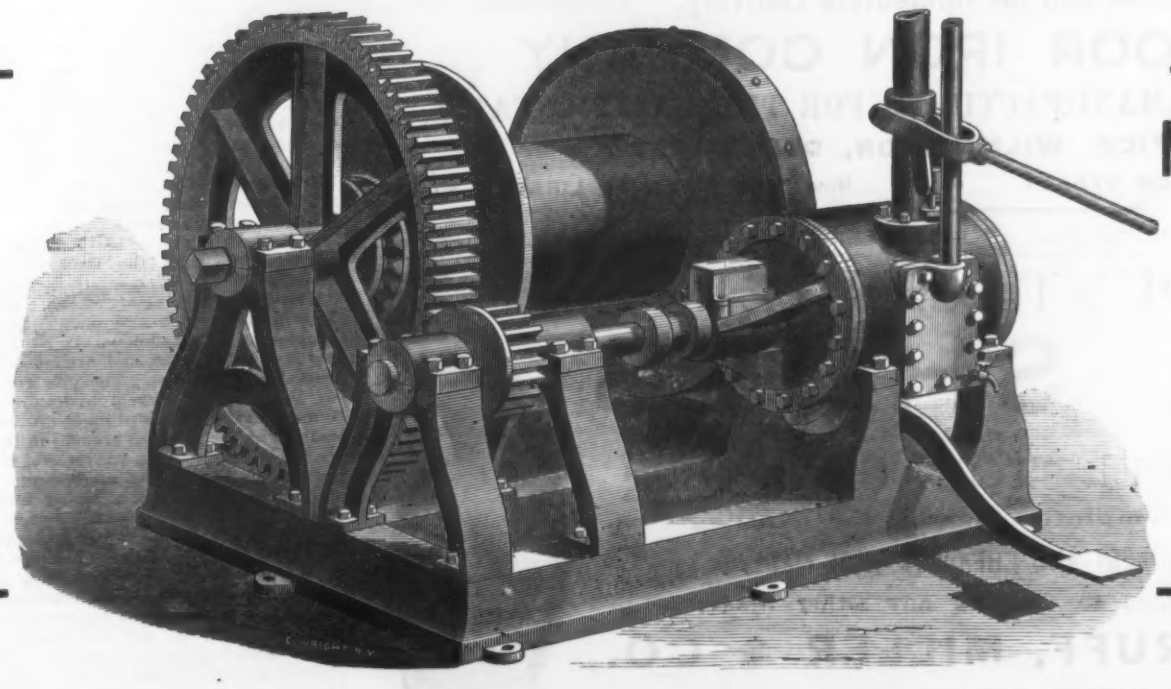

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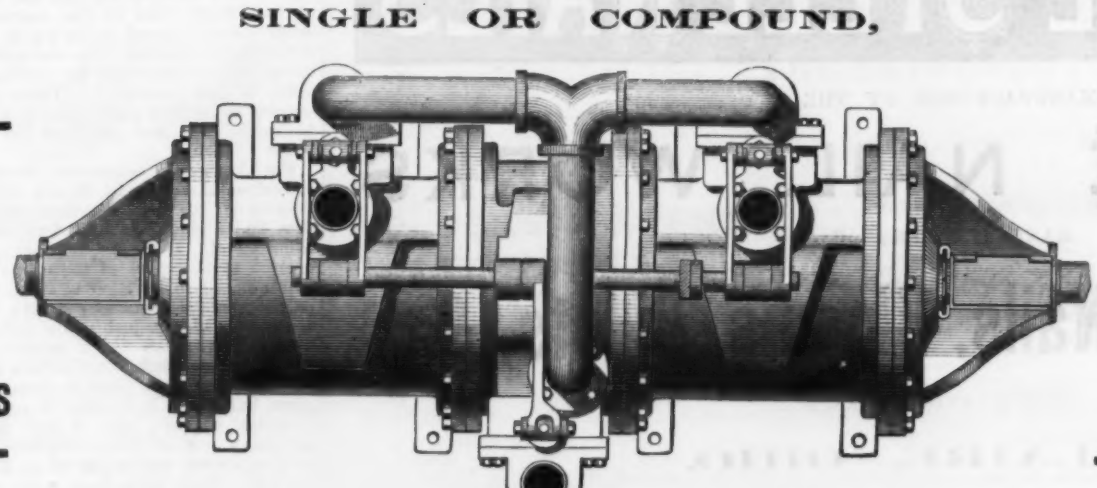

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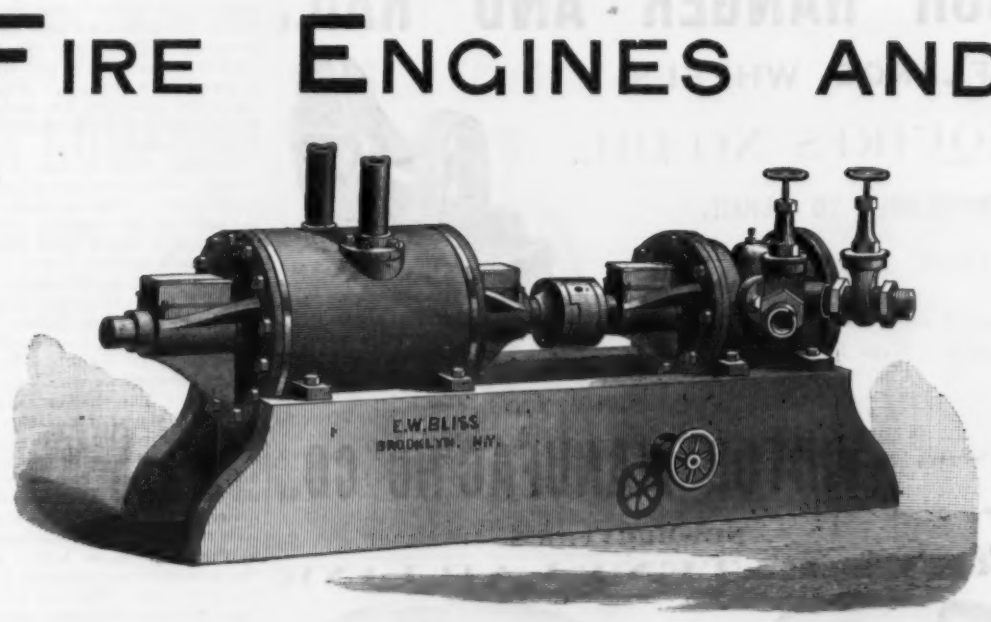

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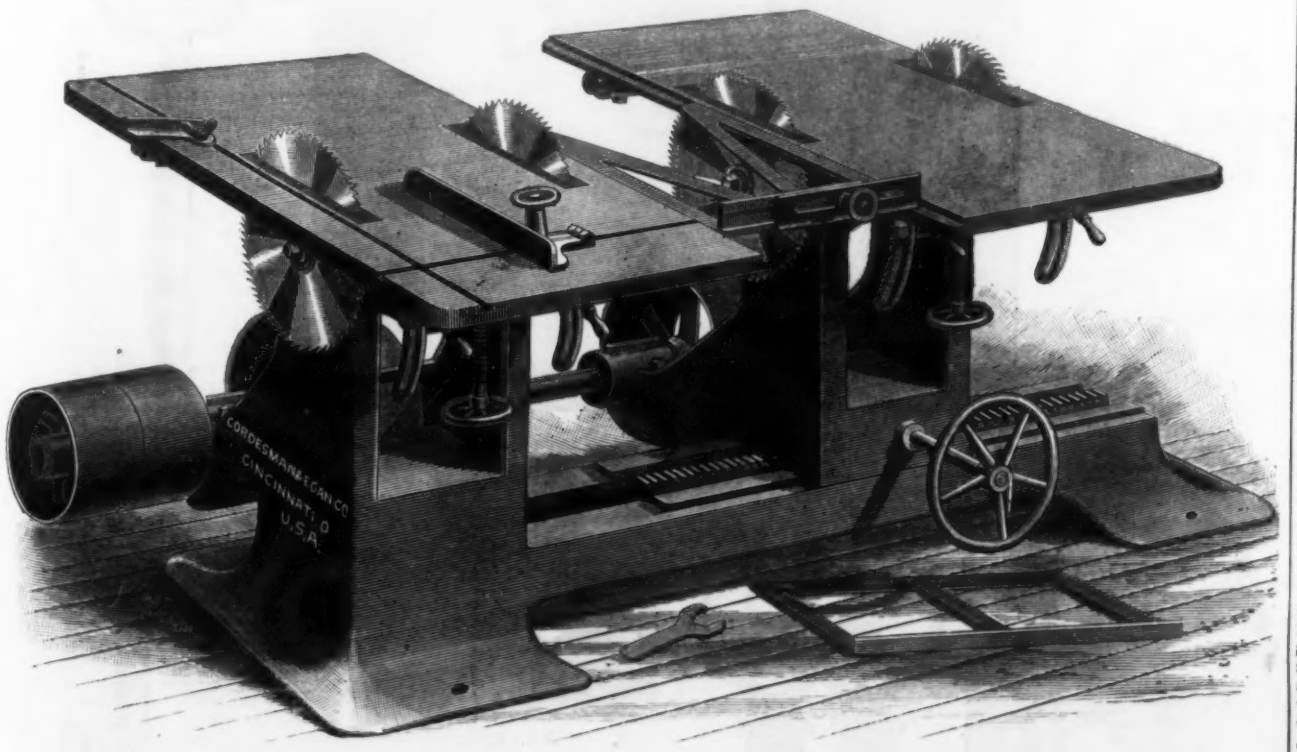
heap played a part in the injury—what proportion he does not know—but he thinks that splitting the difference would about make things even, so he awards the railroad company $800 damages.

Iron Frame Double Cut-Off Saw.

Among the new machines brought out by the Egan Company, Cincinnati, is an improved iron-frame double cut-off saw, of which our engraving shows a general view. The machine is especially designed for cutting off both ends of any piece from 6 feet 6 inches down to 4 inches in length. The machine is designed all on one frame, and has two tables with two double mandrels and counter-shaft complete, one of the mandrels being adjustable for any length of cut. Either of the four saws with which the machine is provided can be used at one time, or only the two end saws, if necessary. The machine as it is constructed is very advantageous for a large variety of work including such that arises in planing mills and contracting establishments. The frame is very substantial, and has two iron pedestals, each of which contains a double saw mandrel. One pedestal is adjustable to and from the other. Each mandrel has an independent driving belt. The tables are hinged on the pedestal frames and can be swung clear back out of the way for ripping or cropping, and will be found very convenient for such work. A gaining or grooving head can be run on it if necessary. In order to keep the tables in perfect line with the mandrel they are set in planed grooves. The machine is of iron throughout, with mandrels of best cast steel,



IRON FRAME DOUBLE CUT-OFF SAW, BUILT BY THE EGAN COMPANY, CINCINNATI, OHIO.

and the manufacturers claim that it will be found to possess great advantages over most of the machines now in use in points of accuracy, speed and durability.

METALLURGICAL NOTES.

Carbon Determinations.

M. Zaboudsky communicates to the *Bulletin de la Société Chimique de Paris* an article on a new method of determining the carbon in cast iron, steel and wrought iron, of which the following is an abstract: For decomposing the specimen the author makes use of a dry mixture of copper chloride and sodium chloride prepared by evaporating the mixed solutions to dryness. The metal, finely pulverized, is carefully incorporated with this mixture in a mortar; water is added so as to form a pasty mass, and the whole is ground up with the pestle. It is well to place the mortar previously in cold water. For 1 gram of iron 20 grams of the mixture suffice. The trituration is kept up for half an hour. The mass is taken from the mortar and placed in a beaker. The mortar is rinsed with 200 c. c. of ferric chloride of mean concentration (1 part Fe_2Cl_6 to 4 parts of water). The beaker may be gently heated without adding hydrochloric acid. This entire operation takes scarcely 45 minutes, when the residue may be collected on the filter. The author has determined the quantities of carbon contained in the residue submitted to combustion, and gives the results in a table. He considers that the calorimetric method of Eggertz may serve to determine the carbon rapidly, but it requires great skill, and the results are not mutually comparable with metals of different origin.

Extensive Use of Bessemer Steel.

How near Bessemer steel can be brought to crucible in its usefulness for tools, says an English exchange, is a matter than which there are few more important to the machinery engineer. The advance of the Bessemer metal in this respect means to him a considerable saving of money. It may not, perhaps, be generally known that the Barrow Hematite Steel Company are doing a good deal in the production of Bessemer steel for uses hitherto served by crucible steel. In addition to their usual outturn of heavy steel, in the form of rails, blooms, tires, &c., the company are producing upward of 1000 tons per week of special steel, which is being worked up in various parts of the Kingdom into all the following forms: Roll-turning and lathe-turning tools, chisels, files, shear blades, rail drills, rail punches, shear steel for welding to iron, miners' drills and tools, picks, shovels, hand hammers, roller bar and cotton spindles, locomotive engine, wagon, carriage, coach and furniture springs, bolts, nuts, rivets, pit ropes, telegraph, crinoline and corset wire, umbrella frames, wire for musical instruments, and the like. Nor has cutlery itself been found too hard a test; for this special steel has been made even into razors with decidedly good results. Touching the extent to which the articles answer, it may be mentioned that a 1-inch pit chain, made from a soft sample of this special Bessemer make, withstood a breaking load of 35.63 tons; elongation, 6 inches or 18 inches. The welding had been done by a smith not accustomed to chainwork. This is very encouraging to machinery engineers, with whom Bessemer steels are gaining favor to the supplanting of cheap cast steels.

New Alloys.

New alloys of the brass-iron type, says the *English Mechanic*, have been recently patented by Mr. G. A. Dick, of London, the most important of which consist of brasses, or compounds of copper and zinc, containing a small percentage of phosphuret of iron or ferromanganese, or both, which are more uniform in composition and more readily worked than alloys of the kind previously discovered. In order to carry out his present invention Mr. Dick employs phosphuret of iron containing from 2 to 20 per cent. of phosphorus or ferromanganese or spiegeleisen containing up to 70 and even more per cent. of manganese. The proportional constituents of the phosphuret of iron, ferromanganese or spiegeleisen, which are of the ordinary trade character, must be known or ascertained. The phosphuret of iron or ferromanganese is dissolved in molten zinc to saturation, taking care that the bath is maintained at as high a temperature as possible without volatilizing the zinc—that is to say, to about 1200°—and the zinc will then take up as much as possible of phosphuret of iron, ferromanganese or spiegeleisen—about 8 or 9 per cent. in each case. If the bath is kept at a lower temperature the amount of phosphuret of iron or ferromanganese or spiegeleisen taken up will be less than 8 or 9 per cent., the amount so taken up depending upon the temperature employed. As the proportional quantity of phosphorus or manganese combined with the iron will be known, it is evident that the requisite quantity of iron and phosphorus and manganese can be introduced into the alloy with great nicety and accuracy. The saturated composition is, with or without a quantity of pure zinc, added to molten copper. The proportions of copper and zinc employed in the manufacture of the above alloys are from 45 to 75 per cent. of copper combined with 55 to 25 per cent. of zinc compound containing the phosphuret of iron, ferromanganese or spiegeleisen, or mixture of the same alone or combined with pure zinc. Ferromanganese frequently contains silicium, which increases the tenacity of the alloy, and if the proportion of the silicium contained in the ferromanganese exceeds ½ per cent., Mr. Dick adds a proportionally larger percentage of pure zinc than he would do if no silicium were present. The preliminary combination of zinc with the phosphuret of iron, ferromanganese or spiegeleisen, as effected by the method described, requires but a comparatively low temperature for its formation, the phosphuret of iron, ferromanganese, or spiegeleisen, being brought into contact with the molten zinc while in the solid state (in excess), whereby the oxidation of the phosphorus or manganese present is avoided, which is not the case when the phosphuret of iron, ferromanganese or spiegeleisen is melted at a high temperature and then added to the molten copper, it being well known that the ferromanganese and spiegeleisen require an extremely high temperature to melt them.

The Otto Coke Oven.

A recent issue of *The Iron and Coal Trades Review* contains a translation from *Stahl und Eisen* of an interesting paper by Dr. Otto, the inventor of a well-known form of coke oven, explaining a new system for recovering the by-products. This system is practically a combination of the Siemens regenerating furnace with the Continental system of coke ovens. It has been tried with a set of 20 ovens at the Pluto Pit, near Wanne, and with another set of 20 ovens at the Silesian Coke Works, at Gottesberg. The results have been so satisfactory that about 120 ovens are now in process of construction upon the system. The coke ovens of the Pluto Pit are formed in the long, narrow chambers which are usual on the Continent. Their length is 29.5 feet; width, 2 feet, and hight, 5¼ feet to the springing of the arch. The distance of the ovens, center to center, is 3.1 feet. In such ovens, when made on the ordinary system, there are openings in the coking chamber through which the gases pass first into the side walls and then into a flue running along the bottom. They are there burned in combination with air admitted from outside, and this heat is sufficient to carry on the coking process. In the present ovens there are no such openings in the coking chamber, and the only apertures except those for charging and discharging are two small holes in the roof, through which the gases developed escape from the oven. Within the side walls and below the springing is a horizontal flue connecting several vertical flues. There is also a flue below the bottom, which is divided into two parts by a wall running along the center. Each of these compartments is connected with two regenerators placed side by side. Of each pair of regenerators one serves to heat the gases used for combustion, and the other to heat the air employed for burning these gases. The regenerators are in the form of long flues filled with bricks arranged in zigzag rows, so as to give a large heating surface. They pass under the group of furnaces, and at their ends are connected by movable valves, in the one case either with the air-inlet valve or with the chimney, and in the other case either with the gas-inlet pipe or with the chimney. Let us now suppose the oven to be filled with coal and the coking process going on. The gases escape through the openings in the roof into a wrought-iron receiver placed above the furnaces, and from thence into the condensing apparatus, consisting of a gas cooler and gas washer. In this apparatus the tar and ammonia are deposited. The gases are then drawn by the same exhauster which has forced them into the apparatus, out of the last chamber and sent back to the ovens. According to the position of the valves they now pass into one or other of the gas regenerators mentioned above. At the same time the air is entering from the outside into the air regenerator, which lies side by side with this gas regenerator, and opens jointly with it into the flue at the bottom of the ovens. The hot gas and hot air mix in this flue, and combustion follows. The heated products, after passing along the flue, rise into the horizontal flues placed below the springing of the arch, fall through the vertical flues in the side walls, and so descend into the other half of the flue below the floor. They are by this time completely burnt, and now pass through the other pair of regenerators to the chimney, heating the brickwork on their way. After a certain time, say one hour, the position of the valve is changed, and the first pair of regenerators, which have by this time lost their heat, are exposed to the escaping products of combustion, while the other pair, which are now fully heated, are used to give the requisite heat to the entering air and gases. This was the original construction; but in practice it is found that it is sufficient to use regenerators for the air only, and not for the gases. It was found difficult to prevent leakages from one generator to another, and also a considerable loss of gas whenever the valve was shifted in position. There was also some danger of explosion of the heated gases. Lastly, as the quantity of air required is about six times that of the gas, the saving obtained by heating the latter was not of much importance. Instead of four regenerators, two are now all that are required.

The advantages of the regenerator system in rapidly and economically heating large quantities of air are well known from its use in the blast furnace. At the Pluto pit the temperature attained is 1000° C., and the combustion is thus very rapid and satisfactory. The quantity of gas delivered is found to be considerably more than is required for the coking process, being about 100 cubic m. per oven per day. The temperature in the ovens is so high that with an ordinary charge of dry coal coking is completed in 48 hours. The heat is also entirely under control, because the quantities, both of gas and air, can be regulated as required. The quality of the coke is excellent, and the yield about 7 per cent. higher than in the ordinary ovens, viz, 68 instead of 61 per cent. This is due to the absolute exclusion of air, in consequence of the excess of pressure maintained within the ovens. The temperature in the flue under the floor was found to be 1200° to 1400° C.; in the side walls, 1100° to 1200°; in the regenerator at the commencement 1000°, and at the end 720°; finally, in the chimney, 420°. The gas coolers consist of vertical iron cylinders filled with iron tubes, fastened to the bottom and top of the cylinder. At the top is fixed a casing into which cold water enters; it descends through the tubes and cools the gases which find their way among them. Several cylinders are connected in such a way that the cooling water passing away at the bottom of the first enters the second, and so forward, while the gas takes the opposite direction. The gas as it leaves the oven has a temperature of 600° to 700° C. This falls to about 400° in the receiver to 120° before it enters the cooler, and to 30° or less when leaving it. A large quantity of the tar and ammonia, about three-fourths of the latter, are deposited in the coolers. The gas washers also consist of vertical iron cylinders, which are filled with a number of horizontal sheets pierced with holes and set about 4 inches apart. The cold water trickles on to the uppermost sheet and falls in rain from one to another until it reaches the bottom. The gas rises upward and is washed by the water in its ascent. This water returns over and over again through the washers until it is sufficiently rich in ammonia to be fit for the market. Several washers are connected in such a way that the water may be made richer and richer in ammonia as it passes through them. They are found to condense the whole of the ammonia, and also to withdraw from the gas a considerable quantity of tar. The temperature of the gases may be brought down to 13° C. The separation of the tar and ammonia is attained in the ordinary way by allowing the former to settle in cisterns provided for the purpose. At the Pluto works it is not turned into sulphate of ammonia, but is simply sold as an ammoniacal solution at a price varying according to the proportion it contains.

The Dynograph Car.

The car perfected by P. H. Dudley for automatic or mechanical inspection of railroad tracks is very ingenious. By delicate machinery connected with the axle of the car by belts or cogs, every vibration, tilt or perpendicular variation in the position of the car is noted on paper with pens set for the purpose, and the record thus made is reduced on paper by the expert in charge, who thus far has been Mr. Dudley himself. Thus a complete and accurate chart of the track in profile and alignment may be submitted to the section superintendents, showing not only the amount and kind of work required to perfect the road, but also the precise places referred to mile-posts on the on the road where the work should be done. The registration of these machines is so perfect that Mr. Dudley can, if the rails are comparatively new, tell, when passing at the rate of 20 miles an hour over a railroad, what mills rolled the rails on which he is riding, and knows at once when passing from rails of one manufacturer to those rolled by a different maker. From the record thus made Mr. Dudley makes up a profile map of the road, which, by curved lines, shows, on a scale of ¼ inch to the mile, the following things: 1. Any irregularities of gauge along the line. 2. Defects in horizontal alignment of the rails. 3. The grades along the railroad. 4. The condition of the track at any point, compared with a perfect track. 5. Whether and how much the track can be improved by labor, or whether new rails alone are needed to make it more perfect. 6. The brand and kind of rails used on each mile of road. 7. The number of years each rail has been in place. 8. The comparative percentage of tangents and curves per mile of road. This map, completed, costs $2.50 per mile, the high price coming mainly from the immense amount of work required to interpret the results, and the delicacy and cost of the instruments used in the work. Mr. Dudley is the inventor of all his instruments, and inspects each year from 6000 to 10,000 miles of track, living on his car during these trips. From 3000 to 5000 "miles" of paper are kept in the car constantly, and 15 gallons of ink per 100 miles of track are used in "spotting" low places.

The Himrod and Kemble Companies.—The New York *Daily Bulletin* says: The Himrod Furnace Company, it was stated at the office, No 20 Nassau street, on Wednesday of last week, had arranged with the creditors at Youngstown, Ohio, to keep the furnaces going, and the company had not failed. Mr. R. A. Wight, its president, made an assignment a few weeks ago. From other sources it was learned that the company had secured 21 of its creditors by giving mortgages aggregating $131,349, among which were the following: Third National Bank, of New York, $12,000; First National Bank, of Youngstown, $31,000; Jefferson National Bank, of Youngstown, $3000; Deposit and Savings Bank, of Pulaski, Ohio, $7000; Exchange Bank, of Wheeling, W. Va., $9000; Iron City Bank, of Pittsburgh, $5000; Youngstown Coke Company, $4000; Second National Bank of Ravenna, Ohio, $3050; Monongahela National Bank, of Brownsville, Pa., $3500; Republican Iron Company, $4400; Alva Bradley, $25,284. The company was incorporated in this city about 20 years ago, with a capital of $60,000. At the office of the Kemble Coal and Iron Company it was stated that arrangements were in progress for a settlement of the company's troubles. Several meetings of bondholders and stockholders have been held with a view of forming some plan to put the company on its feet again. A number of schemes had been discussed, but nothing definite has yet been decided upon, but it was thought that the matter would be satisfactorily arranged very shortly. In the meantime the works are kept running, and have not stopped since the company's failure.

New Form of Bayonet.—Colonel Rice's trowel bayonets were a failure, but the new ramrod bayonets being made at the Springfield armory are described as strong and serviceable. The bayonet portion of the ramrod is 15 inches long, slightly thicker than an ordinary rod, and with a four-grooved blunt point. It is held in position when ready for use by simple spring clasps of Colonel Buffington's invention, and when not wanted is pushed down until it occupies the same position as the ordinary Springfield rifle ramrod, and cannot then cut the soldier's hands. The advantages of this bayonet are: Superior lightness, as a gun thus equipped weighs 1 pound less than one with the regulation bayonet; that it cannot be lost or thrown away during a battle; that it makes it unnecessary for a soldier to carry a bayonet scabbard; and that the course of the bullet is less affected by passing along the length of this bayonet than by the regulation broad bayonet.

TRADE PUBLICATIONS.

Boston Terra-Cotta Company.

The Boston Terra-Cotta Company, with offices at 304 Federal street, Boston, have sent us Part 5 of their catalogue. The book is handsomely gotten up, with red edges, bound in cloth, and displays much taste in its compliation. It contains something over 100 pages, with nearly 50 full-page plates, including some that fold. The representations of terra-cotta work are printed in terra-cotta color, thus closely imitating the appearance of the work itself. The designs have been prepared with great care, and the variety shown is much larger than is usually found in works of this kind. In addition to the usual lines of work made in terra-cotta some mantel and fireplace trimmings are shown. Much of the work presented has the merit of being reproduced from designs executed to order, and contains information where it was employed. The work forms a very desirable addition to the library of any architect or master builder. Near the close of the book several plates are introduced, showing general views of buildings which have been trimmed with terra-cotta manufactured by this firm. Among these may be mentioned the new Cotton Exchange, Memphis, Tenn.; the New York Casino building; the "Berkshire" apartment house, New York; the "Central Park" apartment house, New York; the New York Athletic Club building, Grace M. E. Church, Brooklyn; the Portland Family Hotel, Washington; the new Pension Bureau, Washington. Several of these are supplemented by details of the parts made in terra-cotta. A folding plate contains the designs of sculptured frieze of the new Pension Bureau, Washington. A price list supplements the designs, and a list of buildings, with the names of the architects, on which this company's work has been used is presented, the latter occupying no less than eight pages. The frontispiece contains a front view and section of the special terra cotta kilns used by this company. The second illustration in the book is a general view of the offices and studios of the company in Boston. The building shown displays in a satisfactory manner the application of terra-cotta to building construction.

Balancing the Rotating Parts of Machinery.

We have received from the Defiance Machine Works, of Defiance, Ohio, a little pamphlet which contains a "Treatise on the Art of Balancing the Rotating Parts of Machinery, Together with the Laws Governing the Rotations of Bodies with which Mechanics are Familiar." The statement is made that the facts contained in this work are deduced from experiments by the company that issue it. The work is carefully illustrated, and contains much interesting matter that may be profitably perused by all who are interested in the subject.

A Mercury Galvanometer.—M. Lippman, the inventor of the Lippman capillary electrometer, has devised an ingenious galvanometer, or electric-current measurer. He takes an ordinary mercury manometer, or pressure indicator, and embraces the thicker mercury column between a magnet. Platinum wires are let through the glass to the mercury in the thicker tube, and the electric current is sent through the liquid metal. Now the mercury, being a movable or fluid conductor, experiences a magnetic repulsion due to the mutual action of a magnet on an electric current, discovered by Ampère, and this alters the equilibrium of the gauge. The movement of the mercury is seen in the smaller tube, as a rise of the column, and is considerable for a comparatively feeble current. The rise or fall of the mercury measures the strength and indicates the positive or negative quality of the mercury.

Photographing a Coal Mine.—On the 28th ult. the first attempt ever made to photograph the interior of a coal mine was successfully carried out at Kochinoor Colliery of the Philadelphia and Reading Company, at Shenandoah, Pa., under the direction of James Temple Brown, agent of the Smithsonian Institution. The slope is 500 feet in depth, and the breast photographed is 40 feet wide by 60 feet high. The photographer was G. M. Dretz, of Pottsville. The working was illuminated by the Arnoux electric light. Eight exposures were made, occupying from 10 to 30 minutes each, and resulting in five perfect negatives, showing not only the formation of the coal measures, but also the practical operation of cutting coal and loading cars. The views are intended to constitute a portion of the United States Government exhibit at the coming New Orleans Exposition.

The producers of petroleum on the western shore of the Caspian Sea, it is said, have been seriously contemplating laying a pipe line entirely across Persia to the Persian Gulf. If this were done they claim that they would have the Asiatic market to themselves. This pipe line would have to be something more than 700 miles long to reach the coast, and as it would for a long distance pass through a territory of savage Kurds and other nomadic tribes, it is feared that it could not easily be kept in operation.

From our late Hawaiian advices we learn that Claus Spreckles has contracted to purchase the bulk of the incoming sugar crop, and he has also succeeded in obtaining a subsidy of $72,000 for his line of steamers—say $6000 per month for the steamships Alameda and Mariposa, belonging to the Oceanic Steamship Company, they making semi-monthly trips between San Francisco and Honolulu, carrying Government mails, &c.

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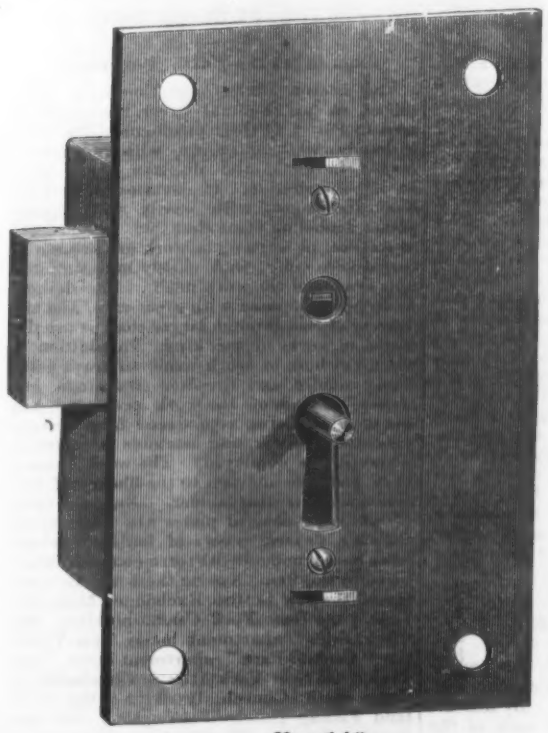
Manufactories at Terryville, Conn., and Geneva, Ohio. **Salesroom at No. 98 Chambers St., New York, U. S. A.**



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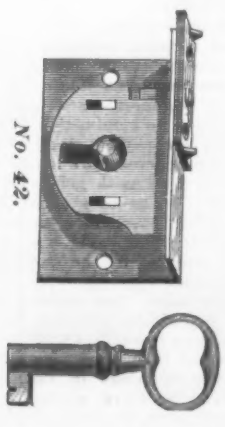

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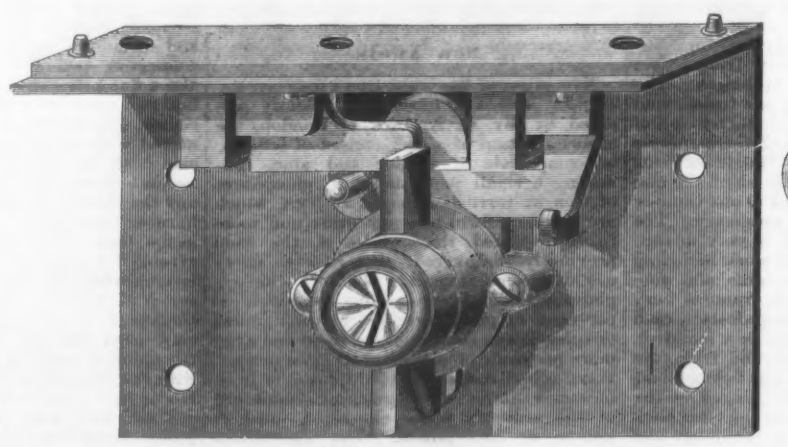

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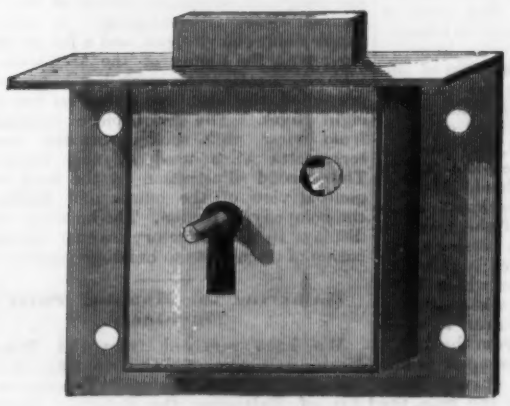

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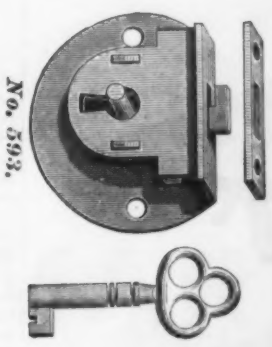

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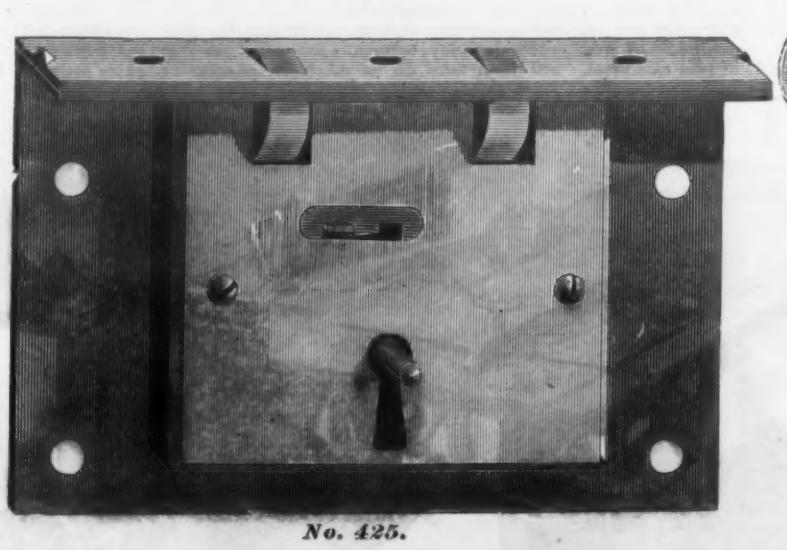

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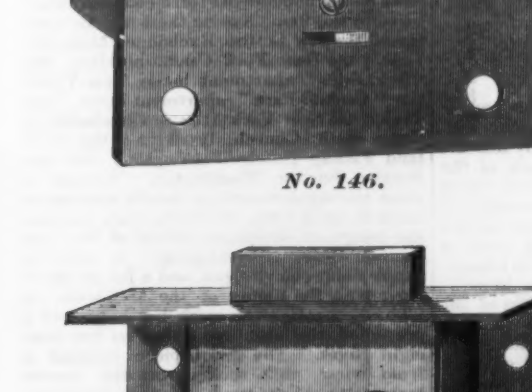

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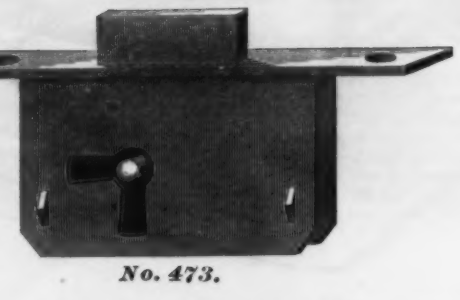

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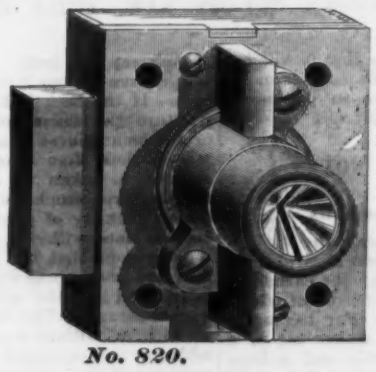

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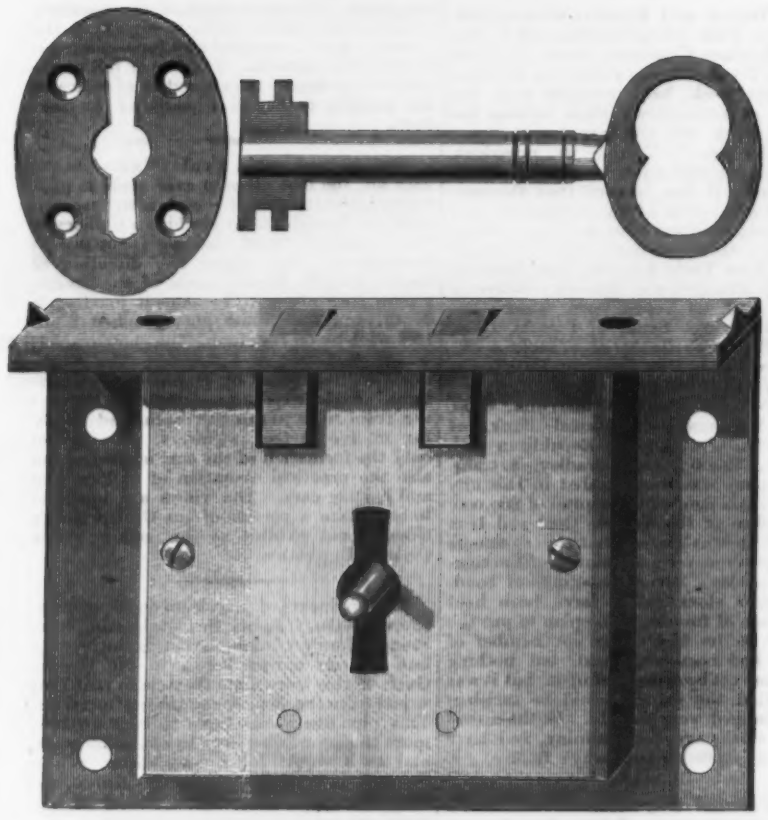

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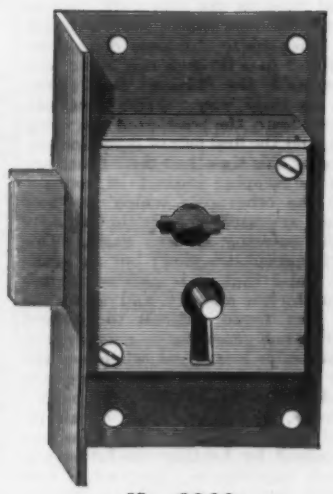

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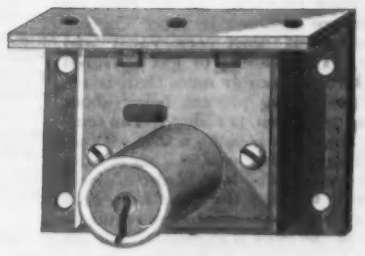

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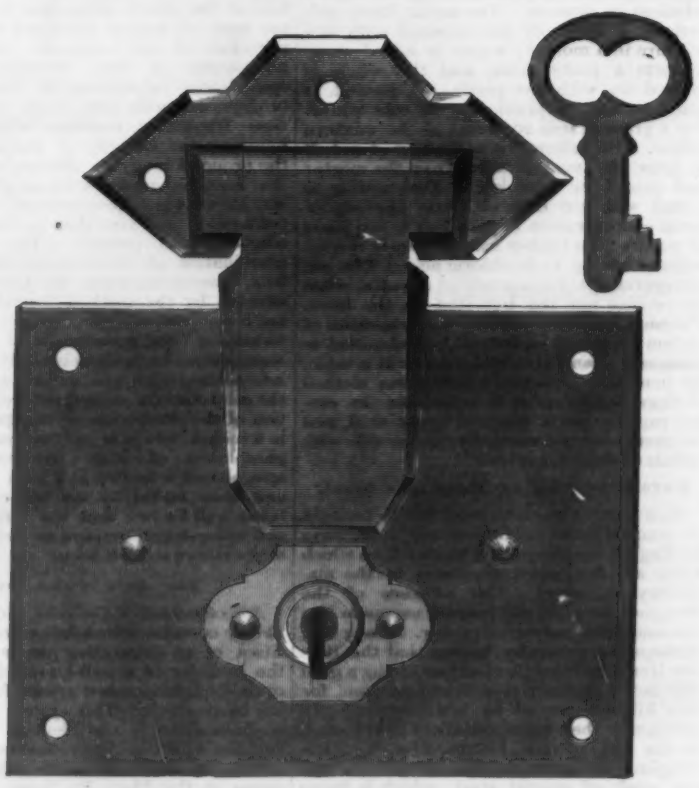

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MANUFACTURERS OF THE LARGEST VARIETY OF

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The Present State of Iron and Steel Manufacture.

The following is an abstract from the address of President I. Lowthian Bell before the Cardiff meeting of the British Institution of Mechanical Engineers :

I purpose addressing you on a metal—iron—of which it is not too much to say that it constitutes a condition precedent to the very existence of both the engineering sciences already referred to. This, and the circumstance of our meeting in one of the oldest seats of the British iron trade, will, I trust, reconcile you to the selection I have made for the subject of my discourse. To myself it is one which particularly recommends itself less from my long association with it than from its affording me an opportunity of acknowledging how immensely the manufacture of iron is indebted for its marvelous progress in recent years to the assistance it has received from the hands of the mechanical engineer. The Dowlais Iron Company, with their accustomed liberality and kindness, will open their works for your inspection. In that renowned establishment you will find a blowing engine delivering its blast from a cylinder 12 feet in diameter, with a stroke of the same length. You will also have an opportunity of beholding a rail-mill engine on the Ramsbottom direct-action principle, the largest of its kind in the world. Now it is no exaggeration to say that the existence of such pieces of machinery as these would have been a physical impossibility for many years after the beginning of the present century. Of the sober truth of this statement you may judge when I mention that I was informed many years ago by the late manager of the celebrated Wallsend Colliery of the difficulty he experienced upon one occasion in obtaining a steam-engine cylinder of about 2 feet in diameter. At that time (probably about the year 1810) there was not an iron foundry on the Tyne capable of casting it, nor a tool in the Northern counties fit for boring it. Ultimately a more enterprising firm in Scotland was persuaded to undertake the work on being permitted to cast it in two pieces, and, in addition, on being allowed to fill up with tram rails the sloop which conveyed it to Wallsend. When a spectator finds himself in the midst of such triumphs of mechanical engineering as are now to be found in every well-appointed iron works, he must be apt to associate the manufacture of iron with the presence of vast mechanical force. Nevertheless, there is no metal capable of being separated from the mineral containing it by simpler means than the one we are considering. Our ancestors supplied their wants by forming a small heap of ore and charcoal on an exposed hillside. There, unassisted, Nature performed the office of a blowing engine ; and with one stone for the hammer, and another for the anvil, as much iron was obtained as served for a people who largely depended on the chase for their subsistence. We have no record of the date at which we in this country emerged from the state of being dependent for the iron we required on such primitive forges as those just mentioned. We do know, however, that for many centuries, probably until the fifteenth, piles of rough masonry, the inside of which occupied a space of 6 or 8 cubic feet, blown by the simplest form of bellows, performed the duty now demanding the help of the powerful and complicated machinery so familiar to every one in this meeting. The advance, thanks to the mechanical engineer, in the construction of the engines employed in our iron works has been so rapid that there are to be found still in use examples of very antiquated modes of manufacturing the metal which survived the changes by which they are surrounded.

I had an opportunity of examining a case in point a short time ago, in a blast furnace built toward the end of the last century, on the great road over Mont Cenis. At the period of its erection that road was probably a mule-track ; at any rate, I have myself performed less difficult journeys over Alpine passes which were inaccessible by wheels. Every one knows what a revolution has been effected in the means of carrying traffic over and through the great natural difficulties presented by the rocky summit of this mountain. The mule has given place to the locomotive, the circuitous path cut in the face of lofty precipices has been abandoned, and a tunnel, designed by the civil engineers and pierced by their mechanical brethren, now permits the passage of tons where perhaps ounces were previously carried, and this at 20 times the speed of former times Thus alongside this achievement of modern enterprise you have the blast furnace in its most ancient form, using charcoal for its fuel, burnt by a current of air induced by streams of water falling down hollowed stems of trees. I visited another equally primitive establishment in the Smoky Mountains in North Carolina. There wrought iron was being made in a Catalan fire, blown, like the blast furnace in Savoy, by the so-called *trompe*, the bloom being afterward drawn out under a hammer very different in principle from that designed by my friend James Nasmyth. Besides the acknowledgment of the immense services rendered by mechanical science to the art of making iron, which this brief retrospect of its progress has enabled me to make, I have other motives in selecting that metal as the subject of the present address. The Bessemer process has revolutionized the process of obtaining it in its malleable form. The product is purer, and therefore better, while the cost of conversion is less than that obtained by means of the puddling furnace. The metalloids which it is the object of both processes to remove, and which are known to injure the quality of the products, are silicon, sulphur and phosphorus.

To illustrate the superior efficiency possessed by the Bessemer converter in separating these three substances, I give the composition of Middlesbro' pig iron, followed by the average composition of the heads of 10 iron rails and 20 steel rails manufactured from Cleveland ironstone. The former were rolled from No. 2 stabbed-down bars, and the latter from steel ingots made by the so-called basic process. These modes of treatment involve two heatings in the mill for the iron rail-head, whereas one only sufficed for that made of steel. The figures given herewith indicate that there remains in the iron rail nearly one and a half times more of the noxious elements than in the steel rail :

	Middlesboro' pig.	Iron rail-head.	Steel rail.
Silicon	1.750	0.159	0.065
Sulphur	0.100	0.041	0 035
Phosphorus	1.500	0.324	0.054
Totals	3.350	0.524	0.214

When the puddling is conducted with extraordinary care, the removal of the foreign matter is no doubt better performed than in the example just given. Thus, a sample of Low Moor cold-blast pig iron, used for the celebrated bars made there, was ascertained to contain : Silicon, 1.380 ; sulphur, .075 ; phosphorus, .620 per cent. This expensive metal is refined and then puddled in small heats. After being flattened under the hammer, it is broken so as to select the best of the iron, which is then piled ; and after one and often more heatings it is drawn into a billet or slab, from which the finished iron is rolled. It is only right to say that unrefined Middlesboro' pig when puddled in a revolving furnace gives, also, a very pure iron. The contents of the three metalloids in these two kinds of iron, and their strength, as certified by Mr. Kirkcaldy, were as follows :

	Silicon.	Sulphur.	Phosphorus.	Breaking weight, tons.	Extension, per cent.
Low Moor	0.016	0.010	0.067	22,771	29.08
Middlesboro'	0.012	0.025	0.085	22,227	29.68

There is, however, an inconvenience connected with the manufacture of malleable iron, comparatively unknown in steel, which occasionally gives much trouble. The cinder or silicate of iron formed during the proces sometimes gets sealed up in the iron, and gives rise to the formation of cavities in the manufactured article. The worst case of all is when the cavity, in the case of a boiler plate, does not manifest itself until it is exposed to the heat of the fire when in use. So far as the three above-mentioned substances are concerned, the quantity in which they are present cannot be said to constitute the difference between malleable iron and steel ; for we have in one specimen of iron more of them, and in two others less, than in the example given of the composition of steel. So far as our knowledge goes at present, both iron and steel would gain by the entire absence of all three. The substance which really distinguishes steel from iron is carbon ; at the same time, as is well known, examples of malleable iron entirely devoid of this element are rarely, if ever, met with. Thus Bowling and Low Moor and other well-known brands of iron, puddled as they are with so much care, rarely contain under half-a-tenth per cent., and frequently much more. In the manufacture of Bessemer steel it is found advantageous to blow the metal until the bath, so far as the metalloids are concerned, becomes malleable iron. This may be seen from an analysis in a case where the pig iron used was that made on the West Coast of England. The blown iron contained : Carbon, .10 ; silicon, .03 ; sulphur, .04 ; phosphorus, .06 ; total, .23 per cent. Now there is evidently nothing, so far as relates to these four substances, to lead us to infer that this malleable iron—for such in point of composition it really is—would not possess all the qualities which render this metal so useful in the arts. As is well known, however, this is far from being the case, and, to render the blown iron sufficiently malleable to resist the tearing action of rolling, manganiferous pig iron requires to be added. Recent investigations have led chemists to ascribe, among other causes, the want of malleability—or red-shortness, as it is termed—in heated iron to the presence of oxygen gas in some form or another. Three speciments made at the Monkbridge Works—one of them red-short—were recently sent to me for examination, and their composition entirely confirmed the soundness of this opinion. On analysis the two samples which were free from this defect contained only .750 and .704 per cent. respectively of oxygen, while the one complained of gave 1.384 per cent. The addition of a substance containing a readily-oxidizable metal, such as spiegel iron or ferromanganese, carries off this superabundant oxygen at the same time that it restores sufficient carbon to give us steel of any desired degree of hardness or softness down to what in the matter of carbon must be regarded as malleable iron. We have now to choose between what chemically may be considered as the same substance, but made in two different ways—in the one case obtained by means of the puddling furnace, and in the other by the use of the converter. By the former method we produce a metal interspersed with cinder, which gives rise to unsoundness, or, when exposed to great wear, causes lamination, so familiar to every one in the case of iron rails. By the latter we have a metal free from both these defects, and to which carbon enough can be readily united to form a true steel capable of enduring twice the tensile strain of the best iron, and under the same wear and tear lasting twice as long as an iron rail. The superiority of quality in the product does not by any means exhaust the advantages possessed by what is often known as the pneumatic over the puddling process. Dissimilar as the two modes of procedure are in appearance, there is in principle not much difference between the two systems.

In the puddling furnace the workman, by very severe labor, exposes the liquid iron to the joint oxidizing influence of the bath of cinder and of the atmospheric air. The combustion of the metalloids under such conditions is so slow, and the radiation and other cooling influences being extended over a much longer time are so great, that 20 cwt. of coal are consumed for each ton of puddled iron made. In the Bessemer converter, on the contrary, the mechanical action of the workman is replaced by the passage of the air up and through the molten mass of pig iron. Fresh surfaces of metal are by this mode of treatment brought so rapidly in contact with renewed supplies of oxygen that the operation on 8 or 10 tons is completed in one-sixth of the time required in puddling 4 or 5 cwt. Very little heat is wasted in the manner so conspicuous in the puddling process, so that the great heat evolved by the combustion of the metalloids, along with that contained in the pig iron as it comes direct from the blast furnace, suffices for the operation. Thus the only fuel consumed is that required for the blowing engine, and the expense of labor is so much reduced in amount that the ton of ingots ready for the mill, including the manganese, costs about 15 shillings less than the same weight of puddled bar made from the same quality of pig iron as that used in the Bessemer converter.

It is now 27 years since this pneumatic process was described by its distinguished inventor, and, with the manifest advantages just referred to in economy of production and in the nature of the product, it may appear surprising that so much puddled iron still continues to be manufactured. This delay in the substitution of a cheaper and better article for one both dearer in price and inferior in quality is due to a variety of causes, some real and others more or less of an imaginary character. First and foremost it was, as might be expected, many years before an entirely new branch of industry was able to compete in economy of production with a process which was invented by Henry Cort now exactly 100 years ago. Immdiately this point was approached, the greater durability of the material for rails having in the meantime been demonstrated, railway companies rapidly abandoned the use of iron rails and had recourse to steel. About the period at which we have now arrived in this brief history of the trade, the great superiority of iron over wood as a material for shipbuilding—which, by the way, it took about a quarter of a century to prove—became generally accepted ; so that as the consumption of the metal for railway purposes diminished that for naval construction took its place. It may well be asked how long in a structure like a ship, where not only strength, but lightness, is so important, will the inferior metal continue to be preferred to the superior ? A partial answer to this question is found in the fact that, for reasons into which space forbids my entering, the cost of rolling steel ingots into plates was for a long time disproportionately high in comparison with that of converting ingots into rails The effect of this difference was that, while steel rails were selling at as low a price as those of iron, plates of steel were often £6 a ton dearer than those of iron. This difference at the present moment does not exceed 50 or 60 shillings, and as a steel ship of the same strength as one of iron is much the lighter of the two, the occupation of the puddler in connection with naval architecture bids fair to follow the example already afforded by railways. Again, the introduction of steel into the construction of locomotive engines and the rolling stock generally of railroads was very properly a work of time. Fears were expressed and open assertions were made as to changes taking place in the molecular structure of objects exposed to violent percussion, which by sudden rupture might be the cause of disastrous consequences. These fears have been shown to be almost, if not entirely, groundless, and the use of the new material, produced either in the Bessemer converter or in the open hearth designed by our late lamented past-president, Sir William Siemens, is gradually being extended to many purposes besides those for railways in which great strength and durability are needed.

No doubt by many workers in iron strong objections are still entertained to the abandonment of a material to the manipulation of which they have been accustomed all their lives. Nor am I prepared to deny that this is not always the result of mere prejudice ; for strongly as analyses may point to an almost perfect identity in composition between iron in its malleable form made by two methods, pneumatic and puddling, we must bear in mind how very small a difference in the quantity of foreign matter may greatly affect the quality of the iron containing it. It is possible that this may happen in the case of steel, and yet the defect be remedied by a slight modification in the way of dealing with the metal in the process of fashioning it into the article required. This, however, will be quite enough to delay its being readily accepted by individual workmen, who, although employing iron in small quantities, consume in the aggregate considerable weights of the metal. This delay will no doubt prolong the existence of the puddling furnace among us, but as the nicer details of the pneumatic method become better understood by the manufacturer, and the minuter peculiarities of the product more thoroughly known to the smith, the necessity for the violent exertion of the puddler will probably in a great measure, if not totally, come to an end. Bearing in mind the immense strides which the art of producing iron has made in the last 25 years, the consumer may be tempted to inquire as to the prospects of seeing further improvements introduced into the quality as well as into the cost of the product. As regards the first of these two questions, it may be difficult to predict what can be done by alloying other metals with iron. Something has been tried in this direction, but no marked success, so far as I know, has attended any of the attempts hitherto made. From time to time great hopes—sometimes, indeed, great achievements—are announced ; but there the matter seems to end. On the other hand, past experience as to the effect of those substances taken up by the metal during its passage through the blast furnace does not justify the expectation that any further diminution in the quantity of silicon, sulphur or phosphorus beyond that already attained can very materially add to its strength, while we know that an addition of any of them has a contrary effect.

A word or two on the second question, namely, the existence of a process which carries with it any likelihood of proving more economical than that of the joint action of the blast furnace and the converter. In proceeding to consider this branch of the subject, we may eliminate any possible saving to be secured by a cheaper mode of working the minerals : 1. Because it is not probable that any great reduction of expense can be effected in quarrying limestone or in mining coal or ore ; and 2. Because under any circumstances it is only from diminution in the quantity employed that economy from this source can be hoped for, the saving in mining being common to all processes. At first sight undoubtedly the blast furnace presents an objection, which, however, in my opinion, has had undue weight attached to it. Not only is it alleged that we obtain a product contaminated by substances which admittedly injure its quality, but we also unite with it carbon, which, along with the other elements just alluded to, it is the province of the subsequent operation, be it puddling or converting, to remove. To avoid this circuitous mode of operating, the ancient so-called direct process has been revived, and from no one in recent years has the subject received greater or more intelligent attention than it did at the hands of Sir William Siemens. It would be impossible upon such an occasion as the present to describe in detail all the objections to the process in question. To obtain a rough bloom, unfit without a previous heating and hammering or rolling for the manufacture of a finished bar or plate, more than 25 per cent. of the iron contained in the ore is oxidized. The blast furnace, on the contrary, gives practically in the pig all the metal of the mineral operated on. It is true a portion of the iron is wasted during the process of conversion, but the waste thus incurred is less than one-third of that which happens in the most successful direct process I have heard of.

In the item of labor I am satisfied, by comparing it with cognate operations, that the united wages paid at the blast furnace and the Bessemer converter are considerably less than what would be expended over the direct process alone. If to the expense of obtaining the rough bloom you have to add in one case a second hammering, or in the other case fusion in an open-hearth furnace, the possibility of competing with the combined action of the blast furnace and converter is *pro tanto* diminished. In reference to the operations connected with the smelting process itself, there is no branch of the manufacture of iron in which, during the last 50 years, such great amelioration has been accomplished. By means of excellent machinery, by heating the blast as high probably as it will be found practicable or probably advantageous to raise it, and by a great increase in the dimensions of the furnace, I am tempted to say that we have arrived at a point when further improvement of any moment can scarcely be hoped for. We waste none of the iron contained in the ore ; no more limestone is employed than that found necessary to remove the sulphur and to flux the earthy constituents of the minerals employed ; and the fuel employed is not one-quarter of what Neilson declared it was in Scotland when he discovered the value of the hot blast. This inventor contented himself with blowing in air having a temperature of 500° or 600° F. It is frequently used now at 1400°, and we have been urged to heat it still higher ; but for reasons I have given on former occasions, and which I cannot repeat now, I greatly question whether any great benefit would be derived from a change, which, moreover, it would be found difficult to maintain steadily. The only other item in the cost of smelting iron is the labor ; and this, by proper appliances and mechanical arrangements, has been so reduced in amount that I have estimated that each ton of matter handled during the operation, in a properly appointed work, costs not more than 1¼d.

Statistics of the British Empire.

At the meeting of the British Association for the Advancement of Science, at Montreal, Canada, on the 28th ult., a very interesting address was delivered by Sir Richard Temple, president of Section F, devoted to economic science and statistics. His address was entitled "The General Statistics of the British Empire," and it embraced an enormous amount of information about the territory under the sway of Great Britain, its inhabitants, their achievements, &c. The following are some of the statements presented :

The area of the British Empire is 8,500,000 square miles. Including countries politically under its control, such as Egypt, Zululand and Afghanistan, the total amounts to 10,000,000 miles, or one-fifth of the habitable globe. One-quarter of this area has been topographically surveyed. The total coast line is 28,500 square miles, with 48 large harbors. Only one-fifth of the area is cultivated or occupied. There is room enough in Canada and Australia to support a population of 200,000,000. The total population of the Empire amounts to 315,000,000, of which 39,000,000 are Anglo-Saxons and 188,000,000 are Hindoos. The annual revenue amounts to £203,000,000, of which sum £89,000,000 comes from the United Kingdom, £74,000,000 from India and £40,000,000 from the colonies and dependencies. Only one-fourth of the total revenue is derived from land taxation. Including local taxation the revenue is £264,000,000 and amounts to £1. 5/4 per head per annum. The number of men trained to arms amounts to 850,000, about 700,000 of these being of the fair or dominant race. The defensive armaments by sea and land cost £41,000,000 annually, which is less than that shown by any great State in the world except the United States. There are 560,000 policemen in the Empire, 1 to every 571 inhabitants and to every 16 square miles. There are 246 war vessels and 30,000 merchant ships, manned by 270,000 sailors. The factory steam power in the world is represented by 7,500,000 horse-power ; of that total, 2,250,000, or about 30 per cent., is British. If the main elements of national industry be taken together—namely, commerce, manufactures, mining, agriculture, carrying trade and banking—the total £2,000,000,000 and upward annually is about the same for the United Kingdom and the United States. But the United States are advancing the fastest and are already passing ahead. There are 675,000 persons convicted annually of crime in the Empire, of which number more than nineteen-twentieths pertain to India. The number of paupers in the United Kingdom under relief amounts to 1,000,000, or rather less than one-thirtieth of the population, and the cost of their maintenance is £10,000,000 annually. In regard to the post office the letters posted annually in the world are 5,200,000,000 ; of this total, 1,500,000,000, or 34 per cent., are in the British Empire. Respecting education, there are 5,250,000 pupils at schools in the United Kingdom, 860,000 in Canada, 611,000 in Australia and 2,200,000 in India, making a total of 8,921,000 pupils in the British Empire.

Wood Wheel Washing Machine.

The Union Stone Company's wood wheel washing machine, which is illustrated by a perspective view, is a device by which the worn-out emery coating on wooden polishing-wheels may be removed without injury to the wheels, and also in less time than it can be done in the ordinary way by hand. An idea of the principle of the machine may be derived from an inspection of the cut. The tank, in which, as may be seen, are two rolls, is filled with water until the rolls are partially submerged, care being taken not to have the rolls gather too much water. The wooden wheels are then placed in position, as shown in the cut, where they will revolve freely by friction of the driving-roll, and by their own weight cause the independent roll to revolve. The water which adheres to and is carried over by the rolls is sufficient to soften the glue, and the rolls remove the emery without injury to the wheels, the operation requiring but a comparatively short time—about 10 minutes, it is said—to thoroughly clean the wheels. The speed required is only enough to keep the wheels in motion, the rolls turning about 40 revolutions per minute. Besides the advantage in using this machine due to the saving of time, since a number of wheels can be cleaned simultaneously, it is further claimed that it removes the coating without moistening the leather except on its very surface, and without in the least wetting the wood, thus preserving the wheels and obviating their usual tendency to warp. The Union Stone Company, 38 and 40 Hawley street, Boston, Mass., make two sizes of those machines, 36 and 20 inches, respectively. The other dimensions are the same in both sizes—that is, 12 inches wide and 6 inches deep. All other sizes, however, will be made to order.

The Union Stone Co.'s Wood Wheel Washing Machine.

Pacific Coast Manufactures. — California rejoices in the triumphant development of industrial activities. The San Francisco *Herald* for August 21 says : "The Mechanics Institute Fair, now in successful operation in this city, exemplifies beyond question the wonderful progress that California has developed during the past 30 years in all that constitutes true industrial prosperity. This is everwhere apparent, but notably in the agricultural department, in the vast exhibits of home-made steam and horse-power implements. The machinery department is a wonder to all visitors in the vastness and completeness of its engines steam-power pumps, quartz crushers, mining implements, &c., of great capacity. The California Wire Works exhibit is of great extent and variety of articles. Judson Manufacturing Company exhibit pig iron from the Hotaling Mine and their product in the shape of steel files, nails, tacks, &c. Then we behold the magnificent exhibition of Spaulding & Co.—saws, &c. The Pioneer Woolen Mills Factory have a gorgeous display of California-made blankets, flannels, cloths, cassimeres, hose and flannel undergarments in variety that are exceedingly attractive to all visitors. The California Jute Mill Company have a fine exhibit of bags in variety, and of other jute goods."

On Wednesday of last week the laboratory of the Rensselaer Polytechnic Institute, at Troy, N. Y., was burned, and $5000 worth of its contents destroyed, including a library of 700 volumes.

Judgment for $75,645 has been obtained against the Bankers' and Merchants' Telegraph Company in the Supreme Court in favor of the J. A. Roebling's Sons Company, for wire furnished.

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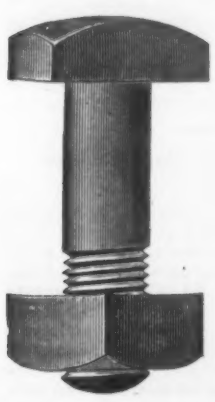

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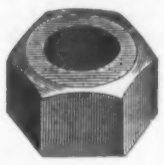

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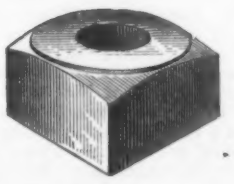

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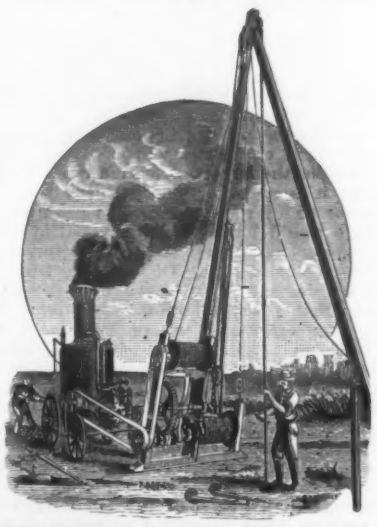

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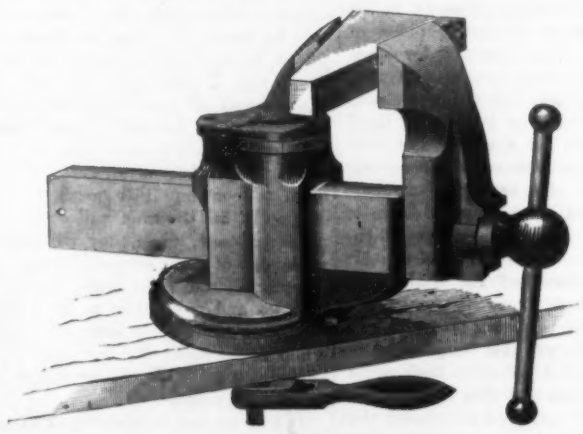

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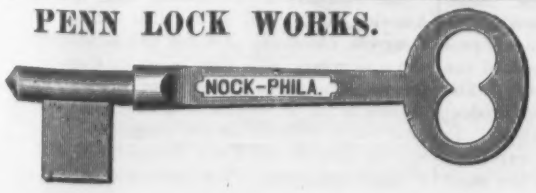

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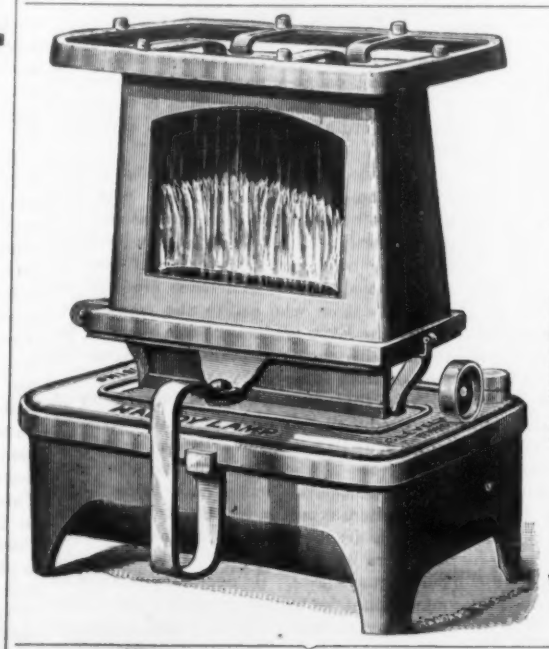

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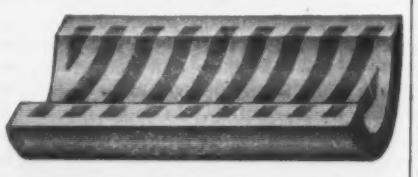

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Panama Canal Estimates.

The recent severe criticisms of the work done on the Panama Canal and the management of the great enterprise have resulted in counter statements by friends of the canal company, who present very plausible reasons for their faith in its completion within the time fixed by M. De Lesseps Among other things it is claimed that the increase in the estimates of work to be done is not real, but is the result of a misunderstanding of the facts by the critics. It is true that the original figures from which the hostile writers get their information fix the amount of excavation at 72,986,016 cubic meters, while more recent computations by canal engineers show 120,000,000, but this discrepancy is explained as follows: The first-named figures have reference to the canal proper, while the latter included harbors, basins and other work not directly in the line of the canal ditch. Eighty million cubic meters are dry work, where 40,000,000 cubic meters will have to be dredged.

Of the 80,000,000 cubic meters of dry excavation there had been excavated July 1, 1884, 5,600,000, leaving 74,400,000 yet to be excavated. There are now at work on the canal 18,000 men, and excavation will soon be increased to 1,400,000 cubic meters per month. At this rate there will be excavated by the end of 1888 the enormous amount of 75,600,000 cubic meters, or more than the estimates call for. The dredges will be able to keep up with work above the water level, so that, it is claimed, there is little danger of the time fixed for the completion of the canal being exceeded.

M. De Lesseps says that in such undertakings the principal work is the beginning. The first earth to be removed is much the more difficult and costly. In the case of the Suez Canal, of 75,000,000 cubic meters to be removed 50,000,000 were excavated in the last two years. He did not think the work would be so difficult as that performed on the Suez Canal, for it was a problem of simple digging, and the experience gained in Egypt would be made available in Panama. According to the latest estimates, the excavation above the water line will consume three years, and that below the water line two years. "Whence it results that even if we should begin the dry excavation January 1, 1885, and the dredging January 1, 1886, the canal would be completed on January 1, 1888, exactly. As an offset to the unforeseen, we have as a margin all that work above water which will have been done before January, 1885, and all that done by dredges before January, 1866." It has been found, as the work on the isthmus progressed, that there existed a less amount of hard rock and a greater proportion than was supposed of soft material, which could be removed easily.

The official report of De Lesseps to the stockholders of the canal company, made July 25th, said that the company had, besides one-half of the capital, which had not yet been touched, 129,000,000 francs in reserve. "Not only," said he, "are we in a position to affirm to-day that nothing up to this time has arisen to interfere with the completion of the canal in 1888, but we are able to show that this promise can be fulfilled with mathematical exactness."

A Heavy Iron Contract.

The contract for the erection of the 14 miles of structure which the Kings County Elevated Railroad Company are about to put up in Brooklyn has been given to the Phœnix Bridge Company of Pennsylvania, under obligations looking to the completion of the work within two years. According to the *Sun*, the Phœnix Bridge Company will occupy toward the project the relation of a "construction company." It will take the railway company's bonds in payment for the structure. There are three distinct routes, one going up Fulton street to East New York, another by way of Myrtle avenue to East New York and the third from the junction of Myrtle avenue and Broadway to the ferry at the foot of Broadway. Work has already been commenced.

By the terms of the contract the Phœnix Company agree to build the road according to the requirements of the plans and specifications of the commissioners under the Rapid Transit act. The Phœnix Company agree to furnish the mason-work, the ironwork for foundations and the cars and engines—to do everything, in fact, but secure the land and pay the land damages and running expenses. The contract provides that they shall proceed at the rate of not less than a mile in six weeks. The bonded indebtedness of the road will not exceed $700,000 per mile for all construction expenses, the quality and character of the work to be equal to those of the Second Avenue Elevated Road in New York, which was also built by the Phœnix Bridge Company. All the capital stock of the company which they are empowered to issue, $1,000,000, has already been subscribed.

It is estimated that the total amount involved in this huge contract is about $10,000,000. Offers from several European and American firms are said to have been before the railway company, but the terms of the Phœnix Company were the most favorable.

A new torpedo boat has been recently added to the Swedish navy, named the Hugin. The vessel is built of steel and is of the following dimensions: Length over all, 116 feet; width, 12.83 feet; draft of water aft, 6.67 feet, and forward, 2.05 feet. The screw is a single one, and the engines, which are of 650 indicated horse-power, are expected to give her a speed of 19 knots per hour. The vessel is fitted with two steam rudders. For the ejection of torpedoes there is an apparatus for discharging Whiteheads 19 feet long and ¼ foot in diameter, the launching tubes being two in number, one on each side, a little above water. The vessel is further armed with a four barrel Palmcrantz machine gun, and fitted with electric-light apparatus. In the stem and stern are water-tight compartments, which may also be used for storerooms. The boat weighs, fully equipped, 54 tons, and cost $40,000.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, September 4, 1884.

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JAMES C. BAYLES, *Editor.*
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Trade Credits Throughout the World.

The Department of State at Washington has recently issued a very valuable series of consular reports on the systems of credit which prevail in the several countries of the world The comprehensiveness of the investigation into this subject is an excellent illustration of the value of a well-organized consular system in securing desira le commercial intelligence. It is only during recent years that the United States Government has recognized this fact and endeavored to utilize the consular service in educating the citizens of this country concerning the characteristics of international trade. In doing this our Government enables the business men of the country to obtain without expense or inconvenience much-needed information, which has been left in the past to individual enterprise, with the natural consequence of individual benefit. Now, however, following the example of Great Britain, our consuls are being used as true representatives of the country in every sense, and they contribute information of such a character that the American merchant or manufacturer who has no time to travel and cannot afford to send out commercial agents to distant countries, is yet able to post himself upon the business methods pursued in foreign countries as well as the class of goods likely to prove saleable there, in case he desired to make a venture in the line of exportation.

The reports upon trade credits in America begin with Canada, in which country, according to the consul-general at Montreal, there has always been a tendency to im moderately long credits, particularly in the Province of Quebec. The credit system is abused whenever the speculative spirit is aroused, or legitimate trade shows signs of being overdone, or the crops are less abundant than usual, the tendency to long credits then becoming strikingly evident. The average time to cash buyers, taking business all through, is 5 per cent. discount, 30 days being considered cash. The retail clothing stores, however, generally allow 10 per cent.; dry goods and fancy goods, 4 to 5 per cent., and provisions 2½ per cent. But at retail stores buyers, if at all responsible, are encouraged to keep accounts and settle quarterly or half yearly. In Mexico nearly all the great mercantile houses sell largely on credits of from four, six to eight months, and often for longer periods, and even the smaller dealers, venders of trifles and hucksters in articles of common use and every-day necessity, whose business is usually supposed to require ready money, are here more facile in regard to credits than in most other commercial communities with which the consul is acquainted. In Costa Rica credits of from six to twelve months have been given on goods ordered from Europe, but, heavy losses having recently been incurred through giving credit too freely, the practice is now restricted and sellers are much more careful. In Cuba the bulk of the trade is based on credits. The wholesale provision dealer purchases his supplies at three, four, six and sometimes eight months' time. He in turn sells to the planter on credit, formerly on twelve months' time, but now rarely more than one to three months is granted. The consul-general at Rio Janeiro, Brazil, says that the long-credit system of that country is a subject of frequent complaint in all business circulars The system has probably been caused in a large degree by the great extent of the country and the difficulties of communication. At least three-fourths of the volume of business will be on credit. With a capital of $20,000 it is usual to be owing about $100,000, or in that proportion. The report from Buenos Ayres says that about seven-eighths of the business is done on credit in the Argentine Republic. In Bermuda fully four-fifths of all foreign products for domestic use are sold on credit. All time sales become due on June 30 when there is no agreement to the contrary. An effort is being made there to abolish the system of long credits.

Numerous reports are published from consuls stationed at various points in Europe. In England credit in the wholesale branch of trade prevails to a very great extent in proportion to the volume of business transacted, and varies from one to six months, while the retail business is conducted generally on a cash basis. Interest is usually demanded on overdue accounts. The following description of English methods, by Consul Shaw, of Manchester, will be recognized as having its counterpart on this side of the Atlantic:

Borrowers who can show that they have made "a good thing" by buying in a rising market are trusted all the more freely on that account. Thus the movement goes merrily onward until at least a check is experienced and the conditions attending the period of expansion are all reversed. Then succeeds a period of drooping, and afterward of persistently low prices, accompanied by contracted credit and universal caution. Afterward there is a season, often prolonged, of slow recovery.

The consul at Cork, Ireland, says that without credit that community, being almost wholly agricultural, could not exist. In Scotland, in large transactions the common terms are cash in three months, with 2½ per cent. discount if paid at the end of the three months; but every trade or manufacture has its own terms. It is understood that no discount is allowed if the account be not duly paid. In small transactions with shopkeepers and tradesmen no discount is allowed. The evils of credit are most conspicuous among the working classes. In Germany the percentage of business done on credit is very large, and credits are said to be longer there than in France or England. In some localities in Germany manufacturers allow the distributing merchants a credit of from three to nine months, or a discount of 5 per cent. for cash. Trade in Belgium is reported to be nearly impossible without credit. A curious society exists in Brussels, under the name of "Union Du Credit," which is described as follows:

In 1848 a number of the tradesmen and manufacturers jointly and severally bound themselves by constituting a guarantee fund to which each of them contributed a determined part proportionate to the total amount of credit he demanded to discount each other's notes. It is in this manner that small tradesmen, who were until then nearly deprived of credit, can now, on being admitted to the "Union," have their notes discounted on moderate terms. The credit allowed now to any one member varies from 500 to 100,000 francs per annum, according to the security he can offer. The members of this society have been increasing every year, and financially it is in a very prosperous condition.

In France it is reported that an almost invariable system of term payment is adopted all over the country, which effectually prevents the abuse of credit. When goods are sold and dispatched to the buyer a bill is drawn upon him (usually at four months) and immediately discounted and put into circulation. Purchasers who might not be exact in remitting at the proper time take care to be ready when an agent of the local bank presents the bill for payment. In Switzerland the credit system in several branches of business is largely in excess in proportion to the volume of business. In Italy credit, if given at all, is very limited, unless against good collateral securities. In Portugal trade is mainly carried on by credits. In Spain the extent of credit in proportion to the amount of business transacted is estimated at one-fifth of the total. In Austria the credit given depends largely upon the commercial reputation of the individual, but it is estimated that in general the amount of credit so received may equal about 75 per cent. of the volume of business or interests involved. In Turkey credit is nearly universal for the actual requirements of life, but in other directions it is also usual. In Russia from one-half to two-thirds of the business is done on credit. In some branches nearly the entire trade is done on credit, and, generally speaking, trade in Russia would be impossible without it.

In Asia Minor it is estimated that three-fourths of the wholesale and four-fifths of the retail trade are conducted on credit. Native produce is sold on two or three weeks' credit, but foreign goods are sold on longer credits. In Calcutta credit prevails to the extent of 80 per cent. At Foochow sales on credit do not amount to more than three-tenths of the trade. In China there is no such thing as a bank proper. The Government gives no official sanction to any institution of the kind, and coins no money except the copper "cash." All banks are, therefore, mere private affairs, and, properly speaking, not banks at all. Their operators are mere private bankers. The immense collections of the foreign customs are thus deposited in private hands—a standard firm, who farm the privilege of using, receiving and paying these funds from the Government. The largest banks are said to get their capital from retired officials, who are expected to amass fortunes during their terms of office. These are, in fact, the bankers, and their emoluments are from the profit of the business. These large banks lend out their funds to smaller ones, who deal in turn largely with brokers who lend to traders mostly on personal security. Sometimes, but rarely, real property is mortgaged as collateral. The rates of interest at the banks vary, as in other countries. Long loans on good names can be obtained at 8 per cent.; short loans, from 10 to 36 per cent., according to circumstances and customers.

In South Africa tradesmen extend credit to mechanics and laborers only who are known to have regular employment and are permanently settled. In Australia business is largely conducted on credit. It may be said that all imported articles are sold on credit to those who sell to the consumers, and to the latter credit is also extended. In the first instance acceptances are given for periods from three to six months.

From these statements the universality of the credit system throughout the civilized world will be noted. Variations exist only in degree—nowhere are transactions conducted exclusively on a cash basis. The cash system is only a feature of retail sales, or of a fractional part of the wholesale transfers of property, or of trade among barbarous nations. So necessary is credit in many countries that the remark is frequently made by consuls, "Trade would be impossible without it." The important part which credit plays in international exchanges has been frequently experienced by some of our merchants, particularly in South America, when they have found British competitors willing to give buyers a year's time in which to make settlements, the long credit thus given acting as a powerful inducement in favor of the British trader, as American merchants hesitate to accept the risks of such a method of transacting business.

The Wheeling Puddlers.

A special telegram from Wheeling to a daily newspaper of this city intimates that the relations between the owners of the rolling mills in that district, about twenty in number, and their workmen have been somewhat strained for some time, and may now be said to have reached a crisis. The principal difficulty arises from the substitution of steel for iron in making nails and sheets. The tendency in that direction has been quite pronounced for several years, but the success of the new steel works erected at Wheeling, for the express purpose of making steel nails, seems to have brought matters more nearly to a crisis than anything else would have done. The competitors of the companies owning these steel works have been forced to imitate their example, at least to the extent of using similar material. The ease and cheapness with which this material can be obtained are indicated in our Pittsburgh market report of last week. While muck bar (iron) was quoted at $29 to $30 per ton, "steel nail slabs" were quoted at $32, the prices of the two kinds of material thus approximating so closely that manufacturers of iron nails have very little advantage in the way of cheapness. It may be possible, too, that, as is often the case, private contracts for steel slabs can be made at even lower figures. This explains why so many puddlers and helpers have recently been discharged by the Wheeling rolling mills.

Although this is an inevitable movement, and it is absurd to endeavor to counteract it, yet there are symptoms of such decided dissatisfaction among the ironworkers of the locality that it would not be surprising at any time to hear of a labor difficulty which would result in the stoppage of the mills for a time. On Saturday evening last a convention of delegates from all the lodges of the Amalgamated Association in the district met in Wheeling. The proceedings were mainly secret, but it was resolved that workmen in all departments should stand by the puddlers. The nailers will demand 20 per cent. extra for cutting steel nails, and perhaps mill owners will be required to sign yearly contracts with their men. It is hardly possible that mill owners will agree to such terms, which would seriously handicap them in their efforts to establish the practically new industry of steel nail cutting. A strike, however, would be a very serious blow to the welfare of that section, and we hope the workmen will take a business-like view of the situation and refrain from precipitating trouble upon not only themselves, but on everybody else in the vicinity of Wheeling. It is hard for the puddlers to be thrown out of work we know, but the effort to make steel nails and steel sheets dearer by increasing the cost of their production will not help the puddlers long to retain their positions before the steady advance of steel. They will have to select some new occupation. We sincerely hope they may all find a more pleasant one.

The Pathetic Features of the Western Pennsylvania Coal Strike.

Recent events at the camps of the striking miners in the Fourth Pool of the Monongehela River illustrate anew how closely in this world sentiments of the most opposite character are joined. It is somewhat amusing to think of 500 or 600 stalwart men gathered in camps, living on army rations when they can get them, and marching out in the early morning under their captains of fifties and hundreds, with all the enthusiasm inspired by a brass band, and endeavoring to persuade some miner with a wife and family to support, and who chooses to support them rather than to remain idle, to give up his laudable attempt. It is also amusing to witness the alacrity with which nearly this whole force not only submitted to arrest, but in agonizing tones begged the officers of the law to take them into custody. It is not so amusing, but dramatic and pathetic in the extreme, when these men gathered in the hall, which was their temporary place of confinement, and begged piteously for something to eat, and when gray-haired men with stooping form and faltering voice sang that touching melody of Foster's, "Hard Times Come Again no More." But even this was not so pathetic as the scene that followed. When the twoscore or more prisoners who had been in such haste to surrender themselves to the officers of the law had pleaded not guilty, waived a hearing and been committed for trial, there gathered about them 25 or 30 women, the wives, mothers and daughters of the arrested men. Over half of this number were mothers and carried babes in their arms. These women stated that they had nothing in their houses to eat, and demanded that they be permitted to accompany their husbands and fathers to jail. People standing by asserted that nothing in "Barnaby Rudge" was so impressive and pathetic as this scene. But the saddest fact about it all is that there was no occasion for such scenes. Ignoring entirely the right and justice of the demands of the men, it is hardly supposable that had these husbands and fathers remained at home with their families and endeavored to secure in some way, by other labor than mining, enough for those dependent upon them to live, these scenes would not have been enacted.

It is evident from the recent methods of the miners of the Fourth Pool that they hope to become such a burden to the county in which the mines are situated, and create so much sympathy among the citizens and taxpayers of the county, as to compel the operators to yield to their demands. This is one result that may follow from this readiness to seek imprisonment and willingness to leave the dependent ones to seek relief from citizens who remain at work and from the county. But did it ever occur to these miners that it may be that the anger and disgust of the citizens of Washington County will be visited upon them? That they and not the operators are responsible for this state of affairs? That as to the justice or injustice of any rate of wages the general public cannot sit in judgment, and if when work is offered them they refuse, and thereby their families become a public charge, that is the man who refuses the work who is responsible for the suffering? We see it stated that the authorities of this county have refused to support the families of men on strike, thus virtually placing the responsibility of the present condition of affairs upon the striking miners, and not upon the operators. This question as to whom working men owe the greater duty, their fellows or their families, is one that demands their most serious consideration, and one that public opinion will not be long in answering.

On Thursday of last week occurred the 25th anniversary of the sinking of the first oil well in the petroleum district of Pennsylvania. Colonel Drake, of Connecticut, in May, 1859, began to drill a well just without the city limits of Titusville, in the hope of striking the vein from which it was believed the oil came that was found oozing through the ground, and on August 28, 1859, at a depth of 69½ feet, the vein was struck. The well at first produced ten barrels a day, which sold at 50 cents a barrel. In September pumping apparatus was applied, and the yield was run up to nearly 40 barrels a day. Since Colonel Drake's discovery more than $400,000,000 are said to have been invested in this industry. In 1859 the total production was 82,000 barrels, and in 1876 the production had increased to 9,000,000 barrels, and in 1877 to 13,000,000 barrels. Since then the yearly increase has been about 5,000,000 barrels. The greatest annual production was in 1882, when it reached the enormous total of 31,789,190 barrels. The export trade has advanced with the production. In 1852–53 it was 600,000 gallons. In 1883 506,000,000 gallons were exported, valued at $44,000,000. Perhaps the most marvelous feature connected with petroleum is the enormous and steadily increasing amount of speculation done in it. The volume of business in 1883 on four exchanges was as follows: Oil City Exchange, 1,821,098,000 barrels; New York Petroleum Exchange, 1,645,475,000 barrels; Bradford Exchange, 1,272,141,000 barrels; Pittsburgh Exchange, 1,265,549,000 barrels; total, 6,003,263,000 barrels. The present financial condition of the oil trade is, however, far from satisfactory. For years there has been an overproduction, stocks increasing at the rate of over 5,000,000 barrels a year. The stocks at present amount to 41,000,000 barrels. Relief is looked for in the increase of the export trade, especially to Asia and South America, and it is believed that the interests of the petroleum industry will receive much attention from the commission recently appointed to make an investigation of our commercial relations with other American countries.

The Amalgamated Association and Arbitration.

We notice that the Amalgamated Association at their recent meeting determined unanimously not to accept arbitration in any form, but to adhere to the present system in settling disputes between their members and the manufacturers. Of course, the Amalgamated Association have the power to do as they please in this matter for the present. Doubtless the method now approved by them of deciding by committees of their own association what is a fair rate of wages, or what may be fair as between employer and employed, results temporarily in advantage to them, and if they are satisfied that all wisdom and all knowledge reside with the Amalgamated Association and their committees, and they possess that rare virtue of looking impartially at all sides, it is well for them to continue this method. But our opinion is that the time will come, and it is not far distant, when they will regret that, in the day of their seeming power, they did not concede that there might be two sides to disputes and two views as to what should constitute rates of wages, and agree that when these views did not coincide an unprejudiced party should be called in to decide between them.

In this matter of rejecting arbitration the Amalgamated Association stand almost alone among trade organizations and trade representatives. Arbitration is one of the cardinal principles of the creed of the Knights of Labor, which is probably the most extensive and powerful of the trade organizations of the country. It has been adopted and urged by the coal miners in the chief sections of the West, such as Western Pennsylvania, Ohio, Indiana, Illinois and Iowa, and the candidate for President who assumes to be the special candidate of the workingmen—General Butler—urges with no stinted words the adoption of arbitration in the settlement of labor disputes. It may be possible that the Amalgamated Association are wiser than all of the other organizations and persons. We doubt it, however, and believe that in seeking a temporary advantage they are storing up for themselves an unhappy future.

Two Foreign Trade Commissions.

The United States Government was among the foremost to recognize the International African Association, and now the Secretary of State has appointed W. P. Tisdel, of Ohio, as the American representative of the association. He will leave this country early in October, and co-operate with European countries, mainly under the auspices of the Belgian Government, in an investigation of the commercial resources of Africa, particularly that region explored by Stanley and drained by the Congo River. Of the character and aims of the association little has yet been made public, but a correspondent of the London *Times*, who has had a long and interesting interview with Mr. Stanley concerning the probable future development of Africa, writes as follows:

Mr. Stanley maintains that the aims of the association are entirely benevolent; they are not anxious to make any profit out of their operations, though, so far as I could understand Mr. Stanley, he does not object to act as an agent for the purchase of ivory and other native products, if the chiefs choose to bring them to him. Indeed, he encourages every means of developing the trade and the resources of the country, though he assured me the object of all his labors would be fulfilled if he could induce honest traders to step in and settle at the various stations on the river. And he has much more faith in the transactions of small white traders than in those of the large houses about the mouth of the river, who might endeavor to monopolize the trade. He would give every encouragement to small traders who, with a modest capital, had enterprise enough to quit the lower river and establish themselves at the upper stations. He assures me that a very profitable business could be done by such traders, and he would do all in his power to assist them, not only with advice, but by allowing them to take advantage of the steamers on the middle and upper river.

In the absence of Mr. Stanley, who is now in England, Col. De Winton will have charge of the affairs of the Congo Association, which is said to have a considerable sprinkling of Englishmen.

The commission to Central and South America, authorized at the last session of Congress, consisting of three commissioners and a secretary, will also leave in October for its destination. Prominent among its objects is the promotion of free commercial intercourse with the several countries in the regions named, which are all republics, with a single exception. The following exhibits

for the year ending June 30, 1883, prepared by the United States Bureau of Statistics, shows the present extent of the foreign commerce of the several countries of South and Central America and Mexico:

	Exports.	Imports.	Total.
Mexico	$28,835,000	$29,290,000	$58,125,000
Guatemala	4,368,000	3,054,000	7,422,000
Honduras (all)	3,415,000	2,885,000	6,300,000
Salvador	5,208,000	3,450,000	8,658,000
Nicaragua	2,110,000	1,300,000	3,410,000
Costa Rica	6,470,000	4,220,000	10,690,000
Colombia	20,126,000	19,367, 00	39,493,000
Venezuela	16,531,000	13,860,000	30,394,000
Guianas (the three)	15,613,000	12,998,000	28,611,000
Ecuador	11,271,000	9,663,000	20,934,000
Peru	43,866,000	28,630,000	72,496,000
Bolivia	3,232,000	2,709,000	5,941,000
Chili	46,482,000	27,160,000	73,642,000
Argentina	60,389,000	61,246,000	121,635,000
Uruguay	22,660,000	19,410,000	42,070,000
Paraguay	4,439,000	3,627,000	8,066,000
Brazil	119,106,000	95,955,000	215,06 ,000
Totals	$413,094,000	$338,824,000	$752,918,000

The following table shows the value of commerce between the United States and the several countries, respectively, of South and Central America and Mexico during the year ending June 30, 1883:

	Exports from the U. S.	Imports into the U. S.	Total.
Mexico	$15,483,000	$8,462,000	$23,945,000
Guatemala	1,6.6,000	3,160,000	4,7?6,000
Honduras (all)	621,000	732,000	1,353,000
Salvador	457,000	589,000	1,046,000
Nicaragua	276,000	438,000	714,000
Costa Rica	466,000	933,000	1,499,000
Colombia	5,485,000	6,990,000	12,475,000
Venezuela	5,967,000	6,672,000	12,639,000
Guianas (the three)	2,119,000	2,826,000	4,945,000
Ecuador	496,000	1,150,000	1,646,000
Peru	297,000	965,000	1,262,000
Bolivia	83,000	323,000	407,200
Chili	1,520,000	2,272,000	3,792,000
Argentina	3,121,000	4,968,000	8,089,000
Uruguay	1,612,000	4,164,000	5,776,000
Paraguay	81,000	243,000	324,000
Brazil	9,253,000	48,382,000	57,635,000
Totals	$48,963,000	$53,319,000	$142,282,000

These tables show that the total foreign commerce of these countries during the fiscal year ended June 30, 1883—the latest period for which we have any aggregate statistics—embraced the enormous sum of $752,918,000, but that less than one-fifth of it was done with the United States. On the other hand, more than one-half of it was transacted with Great Britain. It should be the settled policy of our Government to divert the important volume of traffic represented as above in favor of strictly American channels, thereby building up cisatlantic interests in all the departments of industry, both manufacturing and agricultural. If the commission which has been authorized by Congress, and appointed by the President, shall discover a method by which more of this trade can be controlled to the benefit of the United States, which method shall be both practical and feasible, the wisdom of the creation of the commission will have been established. Previous efforts in that direction, however, have been followed by but little practical benefit. Possibly it has been the fault of our Government in not seconding the advance made by our southern neighbors in the direction of the encouragement of international trade. It will be remembered that they have even gone so far as to subsidize vessels engaged in commerce between our ports and theirs, while our Government has refused to take a step in that direction. As the two great political parties of the country have recognized in their platforms the importance of cultivating closer commercial relations with other American nations, it is possible that public feeling on this question has now been educated to the point of sustaining some bold step that will promise substantial results, if the commission decides it to be necessary and recommends it with force and positiveness.

One of the unsolved problems in connection with the use of natural gas is the permanency of the supply. It is well known that oil wells, which seem in the laws that control them to be somewhat similar to gas wells, "give out;" and this is especially true when other wells are drilled in the vicinity. Two wells drilled near each other will give, on the whole, more oil than one well, but the sinking of the second will almost invariably reduce the flow of the first, and the total output of the two wells is not double that of the first one. Gas wells seem to follow a somewhat similar law. To the well that originally supplied the works of Spang, Chalfant & Co have been added a number of others, so that now, instead of the supply of these works being gathered from one well, it requires the flow of gas from a number of wells. Last week the gas well recently struck at Steubenville by the Jefferson Iron Works suddenly ceased to discharge gas. The proprietors hope that the stoppage of the supply has arisen from the clogging of the well with shale or other extraneous matter, but this is by no means certain, and it is possible that the supply has entirely ceased. It is also no infrequent occurrence for salt water to drown out the supply of gas by filling up the porous sand-rock through which it finds its way to the surface. But even should the supply of gas in individual wells become exhausted in time, it is evident, from the amount of gas that has been found in the neighborhood of Pittsburgh, that the day of this exhaustion is not near at hand, and that in the meantime those Western mills that are so situated as to secure supplies of gas have a very important advantage, in the present depressed state of trade, over sections that are obliged to use coal.

Some striking comparisons of cost in the iron and steel manufacture were made by Mr. I. Lowthian Bell, in his address a few weeks ago as president of the British Institution of Mechanical Engineers, and, although the same conditions may not hold here, our own methods are so near to those which are standard abroad that the figures Mr. Bell gives will very closely represent our own situation. The time required to "convert" a ton of pig iron into Bessemer steel, ready for rolling, is one-sixth of that needed to "puddle" the same iron and roll it into muck bar, and the cost is about $4 less per ton for the steel than for the puddled iron. The force of figures cannot go much further in showing why steel rails now sell for less than the most inferior iron rails ever sold for in the American market, and also why iron rails cannot be sold at any price whatever. Many dealers in iron and steel understand these differences, and so also do some of their customers, but the world at large do not see—indeed, they could hardly be expected to see—the reality and force of so extreme a change—a change, too, which has been brought about within the memory of those still young in the iron business, and also hardly believed in even yet by some who are in active service daily as producers, at the furnace and the forge. It is not too much to say that Mr. Bessemer, whose name will long be remembered as a chief promoter of this vast transformation, clearly foresaw and set forth in words the certainty of the applicability of his metal to all the iron-using arts, and of the sure reduction in cost which would at length be felt.

On the 26th of August the first shipment of iron ore from the Vermilion Lake district, of Minnesota, arrived at Cleveland, Ohio. It consisted of 1200 tons, carried by the schooner Ironton, which sailed from Two Harbors, Minnesota, via lakes Superior, Huron and Erie, to Cleveland. Other vessels arrived at Cleveland and neighboring ports with more ore from the same region during the days following the date above mentioned, and the projectors of this great ore-mining enterprise may now look upon their work as at length in practical operation. This additional supply of iron ore of the finest quality comes at a time when it is not exactly supplying "a long-felt want," inasmuch as our iron and steel industry is now in such a depressed condition that previously existing iron ore mines cannot find a market for their production. But the consumption of iron and steel is only suffering a temporary check, and when a revival of business comes there will probably be a demand for all the ore that the new and old mines in the Lake Superior region can conveniently mine and ship. The Minnesota Iron Company are wise in continuing their work of development in this dull period, for they will thus be all the better prepared for the transaction of an immense business when the time comes.

Very fortunate are the companies now constructing new railroads, in that they began operations so opportunely that they are enabled to lay steel tracks and purchase equipment at minimum cost. One of these companies is the Baltimore and Ohio, whose Philadelphia extension is approaching completion. The capital invested in this undertaking will be wonderfully small, with steel rails at about $27 at mill and locomotives and cars proportionately cheap, especially as compared with old roads capitalized on a basis of twice to three times the cost of these essentials. This is the opportunity for making needed extensions and building desirable branches that shrewd railroad managers should take advantage of. Labor is abundant and cheap, and materials are apparently at their lowest. A year hence the prices of to day may seem utterly out of the question for another considerable period of time.

The Cunard Steamship Company appear to be making great efforts to restore their prestige in the Atlantic passenger trade, which has suffered somewhat from the rivalries of other lines. Following their purchase of the Guion steamer Oregon, they will soon put into the service two new ships, the Etruria and Umbria, which are promised to be fast, and the latter of which will be ready for sea next month. The White Star Line are also moving in the direction of faster vessels, and have contracted for a steamer which they intend shall excel all others; so that the championship of the seas is by no means settled yet, and faster passages than those of the Oregon and America may be expected in the near future.

Philadelphia is enjoying this week an experience of an altogether unusual character. Under the auspices of the Franklin Institute the first great electrical exhibition in America and the fourth in the world was opened on Tuesday. In the evening the fortieth meeting of the American Institute of Mining Engineers began its sessions. During the week the Congress of the American and British Associations for the Advancement of Science is being held. These various attractions have drawn to the Quaker City a large number of distinguished scientists from all over the world.

A Milwaukee statistician, S. W. Tallmadge, whose opportunities for observation and the collection of early information are of the best, estimates the wheat crop for this year at 530,000,000 bushels, consisting of 380,000,000 bushels of winter wheat and 150,000,000 bushels of spring wheat. This makes the total yield of the country fully 25,000,000 bushels more than ever produced, 130,000,000 bushels more than last year's crop, and 80,000,000 bushels more than the average crop for the past five years. These figures are based on the official reports made by the State agricultural departments and statistical agents of the different States and Territories. The departments all agree in reporting the quality superior, and where it has been threshed they say the yield has more than met their calculations. Now, if an extraordinary crop of wheat is all that is needed to bring prosperity to our borders, we have it. But the next thing is to sell our surplus. The prospect for any great result in that direction is not very promising, inasmuch as crops abroad have also been exceedingly good this year. In any event, however, we can congratulate ourselves on one thing now rendered pretty certain—bread will be cheap for another year.

Phosphorus Determinations.

BRIER HILL IRON AND COAL COMPANY,
YOUNGSTOWN, Ohio, Aug. 30, 1884.

To the Editor of The Iron Age.—DEAR SIR: Owing to pressure of business it was impossible to give before this the results of inquiries on the question of comparative phosphorus determinations, which I now give to you in as concise a form as possible. The letters were received in answer to the below circular-letter, sent to a number of our best-known chemical authorities, who, with a few exceptions, did not hesitate to give a candid opinion and answer to the questions therein. The circular-letter read as follows:

YOUNGSTOWN, Ohio, July 1, 1884.

Dear Sir: The last number of *The Iron Age* (June 26, p. 23) contains an appeal to our chemical authorities to give their opinion on the question of accurate comparative phosphorus determinations. Will you favor us by answering the following questions?

1. What is your opinion on the absolute accuracy of the method of precipitating with magnesia mixture and weighing the pyrophosphate of magnesia as described in "Fresenius's Quantitative Analysis, New System," pages 375–376?

2. Do you consider the method of weighing the yellow ammonium phospho-molybdate as reliable in all cases as the former?

3. Do you not believe that by using the first-mentioned method generally for comparative work results from different chemists would be less liable to variation?

The importance of this matter is apparent. If we could get the older and higher authorities to agree, we younger men would have to abide by their decision. All communications will be sent by us to *The Iron Age* as references, and a general statement of their total import made out for publication. If you will use your influence with other chemists it will greatly help this movement. Respectfully urging an immediate and concise reply, I remain, Respectfully yours,

C. A. M.

The letters in reply to this are inclosed to you as references, and I will now, as far as possible, try to give them in extracts, without injury to their whole meaning.

Dr. E. Waller, Ph.D., School of Mines, Columbia College, believes: 1. The greatest attainable accuracy to be obtained from first method, arsenic and silica being guarded against, and no citric acid to be used in precipitating the pyrophosphate. 2. He believes the second method can only be accurate by mistake. Different authorities give different percentage of P_2O_5 in the yellow precipitate, owing, probably, to molybdic acid, which would come down without detection in large quantities. Drying the yellow precipitate may also cause inaccuracies. Ignition, of course, out of question, owing to volatilization of molybdic acid. 3. Seems probable to him that discrepancies would be lower if first method were used, but, owing to variety of methods of manipulation involving these essential features, differences may and do occur.

Dr. P. de P. Ricketts, Ph.D., School of Mines, Columbia College, says: 1. He knows of no more accurate method with proper care 2. He does not consider the second method as reliable as the first. 3. He believes that if all chemists would adhere to the first method, results would be less liable to error. He will do all he can to improve methods at present in use, as he believes that there is considerable room for improvement.

Dr. A. S. McCreath, Harrisburg, Pa., believes: 1 That the method of precipitating as pyrophosphate of magnesia is the most accurate method. 2. He has little or no faith in weighing the yellow precipitate. Results from experiments made by himself were so unsatisfactory that he never adopted it. 3. If samples are carefully taken, chemists using first method should agree closely. He believes variations in samples to be principal cause of discrepancies. In foreign irons and ores arsenic should be guarded against.

W. J. Rattle, Cleveland, Ohio, says: 1. He is a firm believer in first method. 2. He does not consider the second method reliable. 3. He believes that using the first method for all comparative work would give the most satisfactory results, and do away with differences existing between chemists. The sooner they determine on one method the better. He would always advise fusion of insoluble residue in ores, which may contain P_2O_5 even if no titanium be present.

Booth, Garret & Blair, Philadelphia, Pa., say: 1 They do not use the molybdate method at all, but will give result of investigations thereon. Have found the pyrophosphate of magnesia always contaminated with molybdic acid, unless redissolving precipitate in HCl and separating molybdenum by H_2S, and then reprecipitating with Mg mixture. With these precautions consider the first method absolutely correct, providing all P_2O_5 has been precipitated in the first place by the molybdate solution. 2. As the composition of yellow precipitate varies with different circumstances of precipitation—*i. e.*, degree of acidity, temperature of solution, amount of dilution, &c.—and may contain a large excess of molybdic acid, they consider results obtained thereby not only unreliable, but absolutely misleading. 3. They answer this question in the affirmative. They also call attention to the following possible causes of error: Arsenic should be guarded against. The necessity of fusing insoluble residue when TiO_2 or Ti are present. The desire of ironmasters to get all work possible out of chemists, and consequent necessity of quick work, coupled frequently with a lack of thorough education, lower the standard and bring the profession into disrepute.

W. E. Judson, Cleveland, Ohio, says: 1 He does not believe in absolute accuracy, but thinks the first method the most reliable known to the profession. 2. He does not believe that uniform results can be obtained from any of the modifications of above method; can therefore in no instance regard results obtained by second method as satisfactory. 3. Will answer the third question in the affirmative, but believes that more uniformity of manipulation is necessary.

J. A. Emmerton, Joliet, Ill., believes that one method is as good as another when properly carried out; they give practically identical results. He has seen comparative work on the first method differ widely, which he attributes to variation in the early steps of process; thinks an agreement is needed among chemists as to one method to be used in disputes, all preliminary steps of which have been agreed to. With such agreement he considers it indifferent which method is chosen.

S. A. Ford, of Carnegie Brothers & Co., Limited, Pittsburgh, Pa., thinks the greatest source of differences lies primarily in the desire of ironmasters to have quick approximate results, and forgetting that they are only approximate. It happens too often that inexperienced and uneducated young men and even boys are taught to make these approximate determinations, and then think that if their results agree they must be accurate. He speaks about the liability of errors occurring through these boys. He has not used the molybdite method at all, except experimentally, but has seen good results obtained by the same; some of his own experiments also were satisfactory.

These letters need no comment; they speak for themselves. I would call attention to the note of Mr. Charles K. Taylor, which appeared in your paper some time ago. The point on samples is well taken; there is more cause for difference there than anywhere else. If you will indulge me I will reserve a few further remarks for your next issue. In conclusion, allow me to thank, through your columns, the gentlemen who have so courteously and promptly answered my inquiries, although but few of them knew me personally. I sincerely hope some good will come of their efforts in this direction. Very truly yours,

CARL A. MEISSNER.

The Furnace Banking Project.

The latest returns received by the secretary of the Western Pig Iron Association do not indicate that the movement to secure united action in the restriction of production by the banking of furnaces on the line proposed has been accepted by a sufficient number of furnaces to cover the terms of the agreement. The following analysis will show the character of the replies received:

Ignoring all furnaces which are out of blast, those which have contracts for further delivery which will compel them to remain in, and those which use all their own iron, there remain 163 stacks which have sent in replies, and which are covered by the last circular of Mr. Hull. Of these, 78, with 1,031,500 tons annual capacity, agree to cooperate in the movement either by blowing out, by banking up, or by refraining from blowing in, although ready to blow; 60 stacks, with 841,775 tons annual capacity, decline to co-operate, and 19 stacks, with 243,680 tons annual capacity, are uncertain in their replies. This leaves 187 stacks not heard from, of which 138 are known to be out of blast.

From these replies received it is evident to the promoters of the project that, while many furnaces find it impossible to agree to the definite schemes presented they are still in favor of restriction and ready to restrict, but must have a little latitude as to when and how. While, therefore, the schemes advanced have been abandoned, it is by no means apparent to Mr. Hull and his fellow-workers in the project that it must be abandoned entirely, and they are in consultation as to a project that will allow them latitude, and it is believed will secure the end sought—namely, restriction and better prices.

Compass Deviations on Iron Ships.

The deviation of the compass is the problem that continues to vex the seaman, says a writer in a recent issue of the New York *Tribune*, and with every loss of a vessel curiosity concerning this matter is aroused. Only those connected with iron ships have to contend with it, for there is no deviation on a wooden vessel, unless she be loaded with a cargo of iron or steel. Captains of the large ocean steamships are required in England to sign a declaration that they both understand the deviation and can apply their knowledge. A well-known ship-instrument maker in New York City, speaking on this subject, said: "I have seen 14 points deviation in the compass of an iron steamship; that is to say, the needle lacked only two points of being reversed. A popular vessel left this port one Tuesday morning and steamed through mist and fog for 48 hours before the captain could take an observation. When he did so, he found himself 152 miles out of his course. Didn't understand deviation, or there were some unusual magnetic influences which deceived him. Deviation of the compass is caused by polarity of the iron and steel used in the construction of the vessel. It begins with the laying of the keel and clings to the vessel ever afterward. The first thorough practical experiments on this subject were made by Frederick J. Evans, superintendent of the compass department of the British Navy, upon the Great Eastern, built in 1857. She lay, during construction, with her head S. 29° 50' E., and after launching her position was changed 16° from her original direction, placing her head S. 46° E. Superintendent Evans drew the following conclusions from his experiments and observations: That prior to a newly-built iron ship being sent to sea, her head, while being equipped, should be secured in an opposite direction to that in which she was built. The plan was adopted by all the iron steamship builders of England and has been followed ever since."

In English shipyards to-day an observer will see the bows of new vessels all pointing north, because the magnetic lines of force in the earth run north and south, and thus induce positive and negative poles at the bow and stern. In the case of an iron vessel built in England, head south, the north end of the needle is drawn to the bow, or the bow is positive. The steam machinery has the same effect. When an iron vessel is built so as to head north, the north end of the needle is drawn to the stern or the bow is negative. It may be taken as a rule that these vessels with the bow positive have, taking size and other conditions of compass positive into consideration, large compass deviations. The ship is reversed after she is built, in order that antagonistic lines of force may counteract the influence of the magnetism already induced by the first position. You rub your hand upon a cat's back and ruffle the hair. You rub it the other way and smooth it down.

Physical forces affect the magnetism of the iron. The driving and hammering of red-hot rivets has a great deal to do with it. If a vessel has to be hauled on the docks for repairs her compass deviation is considerably changed by the hammering. The proper position for a ship's compass can only be found by practical experiment, for it is different in all vessels. The position of the compass with reference to the machinery in an iron vessel has an important bearing practically and theoretically, for if it is placed in proximity to the funnel, which may be considered as the zero or measuring point for the machinery in general, the inductive magnetism of the machinery is added to the permanent magnetism of the hull. Large steamships carry six or more compasses, distributed from stem to stern, and generally there is one at the masthead. There is what is called a neutral point in every ship—a point at which there is the least possible deviation of the compass—and it sometimes requires two or three years of "shaking down" of the magnetic lines by the vibration of the machinery to fully and accurately determine this point. The compass situated at that point is called the "standard compass," and becomes the one by which the vessel is navigated.

The most important deviation is that caused by the magnetism of the hull and machinery. Then there is heeling deviation, caused by the rolling of the ship. The compass, swinging always in a horizontal plane, when the vessel heels it is brought a fraction nearer the higher side, which, of course, exerts an influence by attraction. Then we have thermo deviation—that produced by heat. A ship in crossing the ocean has her south side exposed to the sun; it becomes warm and induces a current of electricity around the sides, which bothers the needle. This is not as perceptible as the others, and is not often taken into account. The shape of the vessel also affects the deviation. The Montana and Dakota, of the Guion Line, were constructed almost entirely of iron, and their sides came so near together at the deck that the deviation was extremely great. The compasses of neither could be relied on for long at a time. Their yards were of iron, and to brace them was to throw out the compass. Their model has been abandoned.

In reference to the familiarity of captains of iron vessels with this subject, Captain Bentley of the Guion steamer Wyoming, said: "I believe that if the matter were properly investigated it would lay a good many wrecks to the account of compass deviation not understood. Why, I've no idea that in adjusting their compasses here half the captains take into consideration the local attraction—an extremely important item. My compasses may work well enough at sea, but when my vessel is lying in her dock with an iron steamer on each side of her, or may be an iron pier, or a pillar, post, derrick, crane, her magnetism undergoes a change by their influence and the deviation is affected. But there are so many contingencies that it puzzles the brain to keep up with them all. The subject is full of interest and grows more important all the time."

The autumn meeting of the Iron and Steel Institute of Great Britain will take place in the city of Chester, England, on September 23d and three following days. The following is a list of the papers and subjects for discussion: The Geology of Cheshire, by Aubrey Strahan, of Her Majesty's Geological Survey, London; Improvements in the Siemens Regenerative Gas Furnace, by Frederick Siemens, C.E., London; Recent Improvements in the Method of the Manufacture of Open-Hearth Steel, by James Riley, Glasgow; A New Form of Regenerative Furnace, by F. W. Dick, Glasgow; The Manufacture of Crucible Steel, by Henry Seebohm, Sheffield; The Recovery of By-Products from Coal, More Especially in Connection with the Coking and Iron Industries, by Watson Smith, Owen's College, Manchester; The Most Recent Results Obtained in Germany in Utilizing the By-Products from Otto and other Coke Ovens, by Dr. C. Otto, Dalhausen; The North Eastern Steel Company's Works at Middlesboro' and their Products, by Arthur Cooper, Middlesboro'; The Spectroscopic Examination of the Vapors Evolved on Heating Iron, &c., at Atmospheric Pressure, by John Parry, Ebbw Vale. A very attractive set of excursions has been arranged for the Institute, embracing visits to a large number of industrial establishments in the vicinity.

A French engineer in Brazil, it is reported, has lately been selected to construct an enormous dam in that country. The dam will be 940 feet long by 58 feet high, and two smaller ones will close side depressions. This work will, it is calculated, back the water over 1500 acres, and retain 14,000,000 c. m. (49,420,000,000 c. f.) of water, sufficient to provide for all the cattle of the regions during three years, and for the irrigation of 5000 acres of flat bottom land alongside the river bed below. The rivers of Ceara flow in the wet season only.

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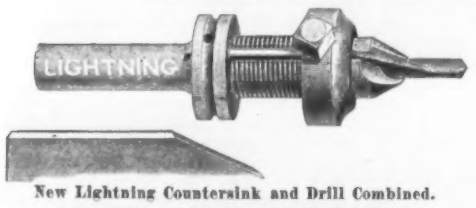

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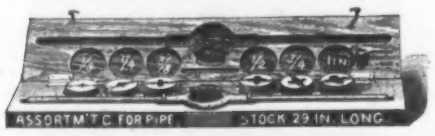

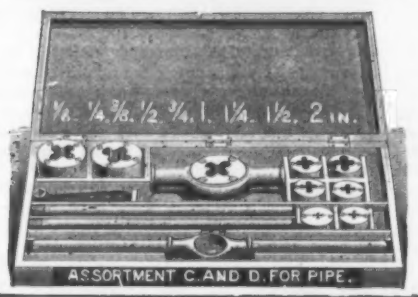

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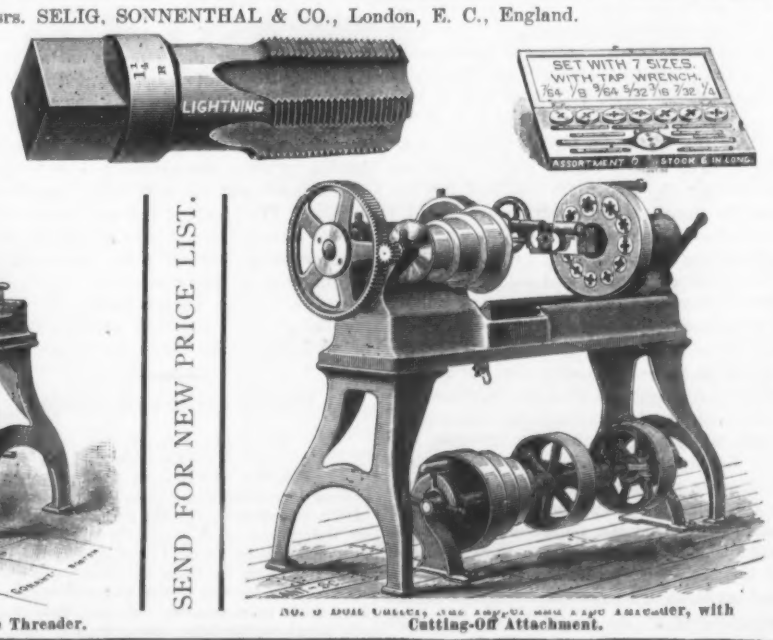

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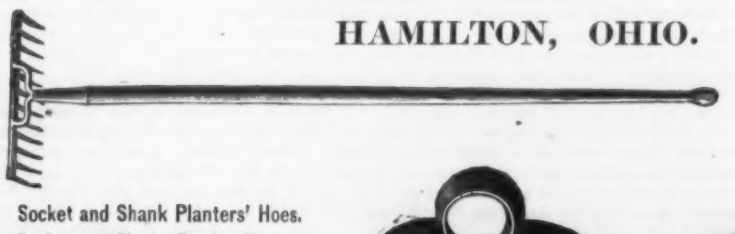

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Fig. 1. — Showing construction and parts of "Attwell Sash Lock" in form of Nos. **100** to **350** inclusive.

A A *Two Locks* (one controlling each sash) working *separately*, but in *combination*, and operated by *one key*, which may be *withdrawn at pleasure*. B *Escutcheon*. C *Removable Key* operating the Locks A A. D D *Bolts of Locks* with heads so shaped as to avoid the "detent;" deemed desirable and given in "*Style A.*" This form is always used when windows are *hung with weights*, and are designated "*Style B.*" E E *Center Marks* on Locks and Escutcheon, given for the guidance of carpenters in applying. L *Lug on Key*, which, in conjunction with metal shoulders cast on rear side of Escutcheon, is used in holding either bolt "shut off" or out of engagement with "strike-plate" in Sash when this may be desired.

Fig. 2.—Showing construction and parts of "Attwell Sash Lock" in form of Nos. **400** to **650** inclusive.

A A *Two Locks* (one controlling each Sash) working separately, but in combination, and operated by one *shaft*. B *Small Escutcheon* with hole in center, through which shaft is passed, and with countersunk space in which head of shaft is pivoted and held. C *Shaft* operating bolts of Locks. D D *Bolts of Locks* with the *flanged head* formation, giving "detent" when engaged with strike-plate in Sash. This form of bolt is employed only in Locks applied to *windows without weights*, and is designated "*Style A.*" E E *Center Marks* on Lock and Escutcheon; given for the guidance of carpenters in applying. G *Circular Escutcheon*, in which the lever-arm controlling-shaft is operated. H *Lever-Arm* (or Yoke), through which shaft is passed. I *Screw*, with bronze head, forming part of lever-arm, and admitting of being lengthened or shortened to suit any thickness of inside-stop. By turning up screw, either bolt, when withdrawn, may be held "shut off," and Locks may be safely closed when locking at points of ventilation by turning screw head into slot in center of circular escutcheon.

Fig. 3.—Section showing parts of "Attwell Sash Lock" (as in form Nos. **100** to **350**) applied to window.

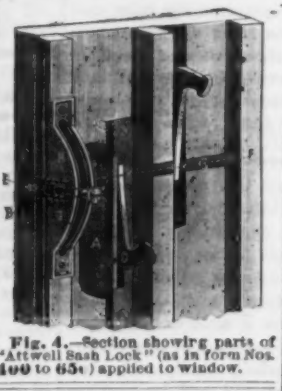

Fig. 4.—Section showing parts of "Attwell Sash Lock" (as in form Nos. **400** to **650**) applied to window.

Fig. 5.—Section showing strike-plates G, their location and application to Sash. This gives four *locking or ventilating points* within a radius of safety from the admission of a thief's body. H is a single or extra strike, used for purposes of *holding* at green or elevation where windows are *without weights*.

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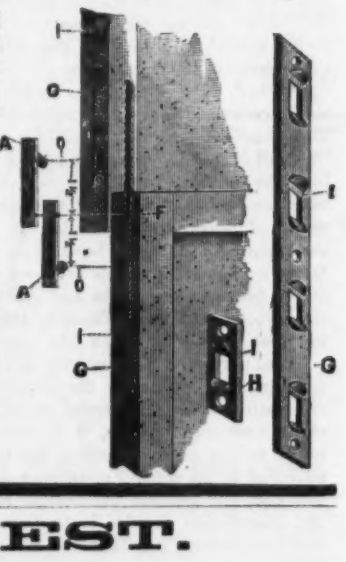

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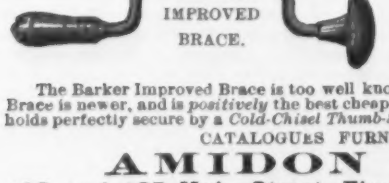

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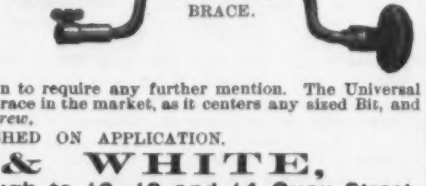

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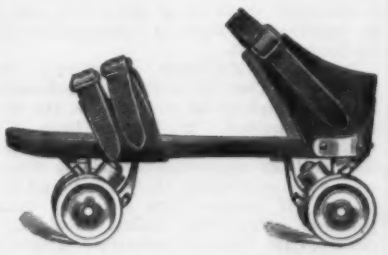

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Notice is hereby given that by an order of the Chancellor of the State of New Jersey, made in this cause on the thirtieth day of August, A. D., 1884, the creditors of The Union Bolt Works, the defendant, are required to present to the subscriber, the receiver appointed in this cause, and prove before him under oath or affirmation or otherwise, as the receiver shall direct, to the satisfaction of the receiver, their several claims and demands against the said defendant within two months from the date of said order, or that they be excluded from the benefit of such dividends as may be hereafter declared by the Court upon the proceeds of the effects of said corporation.

And in accordance with the aforesaid order, the creditors of the said corporation are hereby notified and required to present their claims and demands aforesaid, under oath or affirmation, to the receiver at his office, No. 95 Liberty Street, New York City, or at the office of John W. Griggs, 119 Washington Street, Paterson, New Jersey, within the time limited by said order. Dated September 1st, 1884.

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WANTED—By a practical man, a Situation as Foreman Molder in an Iron Foundry. Have had 14 years' experience as Foreman in first-class foundries, and am capable of taking charge of a Foundry of any size or any class of work and run it to a profit. Best of reference. Address "W. G. H.,"

Middletown P. O., Orange Co., N. Y.

WANTED.—A gentleman thoroughly posted in the Hardware business in all its branches desires a position in which he can utilize an extensive experience to the best advantage. He is well acquainted with the trade, and can furnish unexceptional references as to character and ability. Address "A. B. S.,"

Office of *The Iron Age*, 83 Reade St., New York.

WANTED.

Foreman for Malleable Iron Foundry. Air Furnace man preferred.

DUGGAN-PARKER HARDWARE MFG. CO.,
St. Louis, Mo.

Special Notices.

Machinery, Tools, Engines and Boilers.

Second-hand. The contents of a Machine Shop.

HENRY I. SNELL, 135 N. Third St., Phila., Pa.

One Harrington Gap Lathe, swings 24 in. over shears, 36 in. over gap, with screw feed, compound rest, counter-shaft, &c., complete.
One 19-in. Blaisdell Lathe, 8 ft. bed, with screw and rod feed, change gears counter-shaft, &c.
One Betts Machine Co.'s Lathe, 22 in. swing, 13½ ft. bed, with 15 in. chuck, compound rest screw feed, counter-shaft and pulleys.
One 16 in. Harrington Lever Drill.
One 28 in. Blaisdell Drill, with back gears, power feed and quick-return motion
One Iron Planer, planes 7 ft. long, 22 in wide, with cross down and angle feed, counter-shaft and pulleys
One Iron Planer, planes 22 in. wide, 39 in. long. Counter-shaft, &c., complete.
One 24-in. Selter's Open Die Bolt Cutter, with taps and dies from ⅜ to 2 in.
One Iron Planer, planes 4½ ft. long, 24 in. wide, with planer chuck, cross down and angle feed, counter-shaft and pulleys.
One Double Cylinder and Hoisting Engine. Made by Lidgerwood
One 10 H.-P. Portable Engine, mounted on wheels, with boiler and all attachments complete.
One 50 H.-P. Corliss Engine. Built by Geo. H. Corliss.
Two 75 H.-P. Hor. Tubular Boilers Built by Jacob Naylor & Co 60 in. diameter, 16 ft. long, with 60 3½-in tubes, full fronts, and all castings and fittings in first-class condition.
One 60 H. P. Hor. Tubular Boiler, 56 in. diameter, 14 ft long, 54 3½-in. tubes, with full front and fittings complete. Good order.
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Also a large variety of various kinds of new and second-hand machinery for wood or iron working. If you need anything please write and ask for it of

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We offer, for account of whom it may concern,

Two Perfectly New and Complete

PRATT & WHITNEY CO.

ENGINE LATHES.

1. 10 ft. Bed by 16-in Swing; Gibbed Carriage, Compound Rest, Automatic Cross-Feed, Taper Attachment, Hollow Spindle, Large Face-plate, Stationary and Follow Rests, Wrenches, Countershaft, &c.

Manufacturers' Price, - $683.
Our Cash Price, - - $580.

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Wholesale Hardware Auctioneers,

83 Chambers and 65 Reade Sts., N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

For Sale,

In one of the fastest growing towns in Ohio,

A NEW, CLEAN STOCK OF HARDWARE

in a good Storeroom, with Warehouse connected

Invoice from $6000 to $7000.

Address "HARDWARE,"
Cambridge Ohio.

FOR SALE.

Small Foundry and Machine Shop, in good running order. JOHN C. KILNER,
York, Nebraska.

FOR SALE.

Three Lathes, 2 Planers, 5 Drills, Shaper, Milling Machine, Sensitive Drill, Emery Grinder, Forster Crusher, Bogardus Mill and Mixer.

A. G. BROOKS, 261 N. Third St., Phila.

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An experienced man, personally acquainted with the Jobbing Hardware and Heavy Hardware Trade from Chicago to Salt Lake City, wishes the agency at Chicago for some first-class Eastern manufacturer. Address P. O. Box 5,6,

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A prominent manufacturer of Bolts and Screws desires to make arrangements with a live dealer in Machinists' Supplies, to carry Stock and represent his interests in Philadelphia or Boston.

Address "SCREW MANUFACTURER,"

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Specially arranged for the use of the

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Should have the Counting House edition of

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Cloth Bound; Size, 9 x 11; Large Type (former price, $3.00); will be sent postpaid on receipt of $1.13. Address S. H. JENNINGS,

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Wanted.

WROUGHT AND CAST TURNINGS, IN CARLOAD LOTS.

Address, stating quantity, condition, price, &c.,

SILES & GILL,
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New & Second-Hand Machinery.

NEW.

1 Engine Lathe, 10 in. x 3½ ft.
1 each, Engine Lathes, 11 in. x 4 and 5 ft.
1 each, " " 13 in. x 5, 6 and 8 ft.
1 Engine Lathe, 14 in. x 5, 6 and 8 ft.
1 " " 16 in. x 6 ft.
1 each, Engine Lathes, 16 in. x 6, 7, 8 and 10 ft.
1 Engine Lathe, 18 in. x 6, 8, 10 and 12 ft.
1 " " 20 in. x 8, 10, 12, 14 and 16 ft.
1 " " 22 in. x 8 to 12, 14 and 26 ft.
1 " " 24 in., any length of bed to 26 ft.
1 " " 26 in., " " 46 ft.
1 " " 28 in., " " 38 ft.
1 " " 30 in., " " 38 ft.
1 " " 36 in., " " 29 ft.
1 " " 42 in., " " 26 ft.
1 " " 48 in., " " 29 ft.
1 " " 15 in., x 4, 6 and 8 ft. Rod feed only.
1 each, Turret Lathes, 13 and 14 in. x 5 ft. x 6 ft.
1 Fox Turret Lathe, 11 in. x 6 ft.
1 Fox Lathe, 14 in. x 5 ft. Round Arbor.
1 Fox Lathe, 15 in. x 6 ft. Square Arbor.
1 each, Hand Lathes, 10, 12, 15 and 18 in. swing.
1 Iron Planer, 18 in x 18 in. x 3 ft.
1 each, Iron Planers, 20 in. x 20 in. x 4 and 5 ft.
1 Iron Planer, 24 x 24 x 6 ft.
1 each, Iron Planers, 26 in x 26 in. x 7 and 10 ft.
1 Iron Planer, 30 x 30 in. x 10 ft.
1 " " 36 in. x 36 in. x 10 ft.
1 each, 16, 20, 22, 23, 24, 28, 30, 34 and 38 in. Upright Drills.
1 each, Nos. 2, 3, 4 and 6 Spindle Gang Drills.
1 each, 8, 10, 12, 15, 18 and 24 in. Shapers.
1 each, Nos. 1, 2, 3 and 4 Milling Machines.
1 No. 2 Milling Machine. Lincoln Pattern.
1 New Pattern Milling Machine. Grant & Bogert.
1 each, Nos. 2, 4 & 5 Wire Feed Screw Machines.
1 each, Nos. 3 and 7 Spindle Nut Tapper
1 Boring and Turning Mill, each 50 and 72 in.
1 Gray's Screw Machine, to take all sizes to 1 in.
1 32-in Gear Cutter
1 Grant & Bogert Cutter Grinder.

SECOND-HAND.

1 Engine Lathe, 15 in. x 6 ft. Wood & Light.
1 " " 15 in. x 6 ft. Chelsea Machine Co.
1 Engine Lathe, 24 in. x 8 ft. Taper Attachment.
1 Planer, 24 in. x 24 in. x 6 ft.
1 " 20 in. x 20 in. x 5 ft.
1 " 50 in. x 50 in. x 17 ft.
1 Crank Planer.
1 10-in Shaper.
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1 " " "Brainard" "
1 " " " Universal Miller, good as New.
1 Plain Upright Drill, 30 in. swing, Wood, Light & Co.
1 " " 20 in. "

All kinds Machinists' Tools and Supplies.

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THE TANITE CO., GRANT & BOGERT MACHINE TOOL WORKS,

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Engines and Boilers.

NEW AND SECOND-HAND.

One Lambertville Automatic Engine, 14 x 24. New.
One " " " 12 x 30. "
One Slide-Valve Engine, 12 x 18. New.
One " " 11 x 16. "
One Wright Cut-off Engine, 22 x 36. 2d-hand.
One " " 22 x 42. "
One Dexter Autom. Cut-off Engine, 10 x 15. 2d-h.
One Adjustable Cut-off Engine, 18 x 48. 2d-hand.
One " " 16 x 28. "
One Slide-Valve Engine, 8 x 16. 2d-hand.
One " " 7 x 10. "
One Corliss Condensing Beam Engine, 32 x 72. 2d-h.
One 80 H. P. Horizontal Tubular Boiler

Large stock assorted sizes new and latest improved Engines and Boilers Come and examine our stock. Plans, estimates and specifications furnished for mills and factories, guaranteeing best results; steam engine indicator; cards demonstrated for economy, &c. Send for circular.

NEWELL UNIVERSAL MILL CO.,
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Machine Shop for Sale.

with the good-will of a long-established business, located in the center of the manufacturing district of the city of Chicago. Contains about ten Lathes, three Planers and other Tools in proportion, including a complete line of Engine Patterns—Slide-Valve, Variable Cut-Off and some Automatics. Also, long and valuable lease. This is a fine, complete plant, with the best modern tools throughout, and will be sold at a great bargain. The owner desires to sell on account of poor health, and will give time on good security.

Address "MACHINE SHOP,"

Office of *The Iron Age*, 36 Clark St., Chicago, Ill.

Foundry Property for Sale.

Consisting of Machine Shop, Foundry and all other buildings for the works, Machinery and Tools for Wood and Iron. A large stock of Patterns in a Fire proof Building. Water Power It has a good Jobbing and Repair Trade; a good Agricultural Trade, wholesale and retail. Very convenient to railroad and canal for shipping or receiving goods. This property is very conveniently arranged to add some specialty to what it is now doing. Capacity for 50 men. This property will be sold cheap, and terms easy. Would be glad to correspond with any one about this property.

HUNTINGTON BEARD,
Fayetteville, N. Y.

Business For Sale,

Including five sizes patterns, with sufficient machine and hand tools to work 20 men, for manufacturing a specialty fully protected by patents, and shows good margins. Machine shop, with water-power, will be sold with the business if desired. Address MANUFACTURER,

Care 345 North Salina St., Syracuse, N. Y.

For Rent.

The old-established works of the Easton Lock Co., situated at Easton, Pa. (about 75 miles from New York), consisting of all the Buildings, Machinery, Engine, Lock Patterns, Dies, &c These works have been in successful operation up to the 1st of June of this year. This is an opportunity seldom offered. The buildings are large and commodious, and the Foundry is one of the most complete and largest in the State. Owing to the death of one of the partners of the Easton Lock Manufacturing Co., is the cause of the works shutting down. Here is a business already established and ready to commence operations at once, as all the machinery is in good working order. For particulars and terms, inquire of

HESS BROS.,
Easton, Pa.

A Good Investment.

Bearing Orange Grove, 20 miles south of Jacksonville, on the St. John's River. Forty-three acres. Title perfect. Six Hundred Trees; 300 bearing. House of five rooms; fine water. Crop this year, 50,000 Oranges.

Address "ORANGE GROVE,"

Office of *The Iron Age*, 83 Reade St., New York.

---

59 DUANE ST.

We have rented the above-named building in New York City for a salesroom and branch factory, and shall be glad to see all our old friends and patrons, as well as any in need of anything in our line. Dies a specialty.

THE STILES & PARKER PRESS CO.,
Middletown, Conn.

FOR SALE.

4 to 14 inch. Engines, 2 Portable Engines, Worm Hoist, 2 Baker Rotary Wood Planers, Bogardus Mill and Mixer.

A. G. BROOKS, 261 N. 3d St., Philadelphia.

Special Notices.

NEW AND SECOND-HAND MACHINERY.

1 24-in. Boring Lathe, 8 ft bed. 2d-hand.
1 Engine Lathe, 72 in. sw., 16 ft. bet. centers. 2d-h
1 Engine Lathe, 30 in. swing, 18 ft. bed. 2d-hand.
1 Engine Lathe, 20 in. swing, 18 ft. bed. 2d-hand.
1 Engine Lathe, 21 in. swing, 25 ft. bed.
1 Engine Lathe, 21 in. swing, 14 ft. bed.
1 Engine Lathe, 21 in. swing x 8 ft. bed. New.
1 Engine Lathe, 20 in. swing, 12 ft. bed. New.
1 Engine Lathe, 20 in. swing, 9 ft. bed. 2d-hand.
1 Engine Lathe, 20 in. swing, 8 ft. bed. New.
1 Engine Lathe, 20 in. swing, 8 ft bed. 2d hand.
1 Engine Lathe, 19 in. swing, 10 ft. bed. New.
1 Engine Lathe, 19 in. swing, 7 ft. bed. New.
1 Engine Lathe, 18 in. swing, 10½ ft. bed. 2d-hd.
1 Engine Lathe, 18 in. swing, 8 ft. bed. 2d hand.
1 Engine Lathe, 17 in. swing, 7 ft. bed. New.
1 Engine Lathe, 15 in. swing, 6 ft. bed. New.
1 Engine Lathe, 13 in. swing, 5 ft. bed New.
1 Engine Lathe, 12 in. swing, 5 ft. bed. New.
1 Plain Lathe, bck-grd., 14 in. x 6½ ft. bed. 2d-hd.
1 Hand Lathe, 12 in swing, 4 ft bed. New.
1 Hand Lathe, 10½ in. swing, 3½ ft. bed. 2d-hd.
1 Hand Lathe, 10 in. swing, 4½ ft. bed. 2d-hand.
1 Hand Lathe, 10 in. swing, 3¼ ft. bed. New.
1 Hand Lathe, 9½ in. swing, 3½ ft. bed. 2d-hand.
1 Foot-Power Hand Lathe 8¼ in swing, 3 ft. bed.
1 Oval Turning Lathe 2d-hand.
1 Iron Planer 10 plane 60 in. x 60 in. x 20 ft. 2d-hd.
2 Iron Planers to plane 54 in. x 54 in. x 16 ft.
1 Iron Planer to plane 38 in. x 36 in. x 9 ft. 2d-hd.
1 Iron Planer to plane 32 x 32 x 9 ft. 2d-hand.
1 Iron Planer, 32 in. x 30 in x 6 ft. 2d-hd.
1 Iron Planer, 27 in. x 27 in. x 6 ft. 2d-hd.
1 Iron Planer to plane 24 in. x 24 in. x 6 ft. 2d hd.
1 Iron Planer to plane 24 in. x 24 in. x 5 ft. New.
2 Iron Planers to plane 24 in. x 24 in. x 4½ ft. 2d-h.
1 Iron Planer, 24 in. x 24 in. x 5 ft 2d-hd.
1 Iron Planer to plane 22 in. x 22 in. x 5 ft. New
1 Iron Planer to plane 20 in. x 20 in. x 4 ft. New.
1 Iron Planer to plane 16 in. x 16 in. x 3 ft. New.
1 Shaping Machine, 15 in. stroke, 23 in. traverse.
1 Shaping M'ch., 11 in. stroke, 16 in. traverse. 2d-hd.
1 9-in. Stroke Shaping Machine. 2d-hd.
1 Shaping Machine, 10 in. stroke, 15 in. traverse.
1 6-in. Shaping Machine. Good as new.
1 6-in Shaper. Light. 2d hand.
1 36-in Upright Drill Press. 2d-hand.
1 24-in. Upright Drill. B. G. & S. F. New.
1 20-in. Upright Drill, B. G. New.
1 20-in. Upright Drill. 2d-hand.
1 Four Spindle Gang Drill Press. New.
1 Four Spindle Gang Drill Press. P. & W. 2d-hd.
1 Four-Spindle Gang Drill Press. Very light. 2d-h.
1 Three-Spindle Gang Drill Press. New.
1 Three-Spindle Gang Drill Press. 2d-hand.
1 Bench Drills, wheel and lever. New
2 Bench Drill for ¾ in. holes, lever feed. New.
1 Suspension Drilling Machine. 2d-hd.
1 Hand Post Drill, 15 in. swing, self-feed. New.
1 Hand Post Drill, 10-in. swing, self-feed. New.
1 Double Head Drilling and Milling Lathe. 2d-h.
1 Pratt & Whitney Lincoln Miller. 2d-hand.
1 Lincoln Milling Machine. New.
1 Universal Milling Macnine. New.
1 Power Miller, with Dividing Head. New.
1 Heavy Power Milling Machine, with Arm. New
1 Back-Geared Power Miller, with Arm. New.
1 Column Miller, with Pr. Centers. 2d-hand.
1 Hand Miller. New design.
1 Hand Miller and Screw Slotter, hand feed.
1 Large Gear Cutter. Cuts 20 ft. diam. x 18 in. face
1 Gear Cutter. Cuts 32 in. diameter. New.
1 Gear Cutter. Cuts 26 in. diameter. New.
1 24 inch Slotter to center of 54 in 2d-hand.
1 Square Arbor Vox Lathe, for brasswork. New.
1 4½ in. Centering Machine. New.
1 3 in. Cutting-Off Machine. New.
1 4½ in. Cutting-Off Machine. New.
1 Horizontal Nut Tapper for 3-10 holes. New
1 Bolt Cutter, 1½ in. and under 2d-hand.
1 Screw Slotting Machine. New.
1 Wire-Feed Screw Machine. New.
2 Turret Head Screw Machines.
1 Cutter Grinder. New.
1 Twist Drill Grinder. New.
1 Surface Grinding Machine. 2d-hand.
2 Emery Grinders on Stand. New.
5 Emery Grinders for bench work. New.
1 Die Grinder. New.
9 Polishing Frames, for wood wheels. 2d-hand.
1 Heavy Polishing Frame. 2d-hand.
12 Pair Polishing Stands for wood wheels. 2d-hand.
3 Steam Hammers. New.
3 Shafting Straighteners. New.
1 Power Punch to punch ⅜ hole in ½ in. iron.
1 Power Punching Press. 2d-hand.
1 No. 18 Adjustable Inclined Power Press. New.
1 No. 19 Adjustable Inclined Power Press. New.
1 No. 20 Adjustable Inclined Power Press. New.
3 Power Presses 2d hand.
1 Heavy Bench Screw Press, 3 in. screw. 2d-hd.
1 Screw Press, with Table. 2d-hand.
1 No. 1 Screw Press on Legs. New.
1 Large Foot Press. 2d hand.
3 Small Foot Presses. New.
1 Foot-Power Punching Press, ½ in. x ½ in. New
1 13-in Drop Press. 2d-hand.
1 9-in. Drop Press, 7 ft. guides. 2d-hand.
1 7 in. Drop Press, 5½ ft. guides. New.
1 Hand Lever Punch to punch 5-16 in 5-16 iron.
1 Heavy Alligator Shear, 17 in. Jaws. 2d-hand
1 Heavy Alligator Shear, 7 in. Jaws. 2d-hand.
3 Power Slitting or Circular Shears New.
1 Geared Power Slitting Machine. No 6 Iron. New.
1 Circular Shear for No. 12 Iron. 2d-hand.
2 Squaring Shears for Power. New.
1 22-in. Squaring Shear for light sheet iron. New
1 Squaring Shear, with open throat, for power.
1 Pair 10 ft. Power Bending Rolls. 2d-hand.
1 Double End Power Bending Machine. 2d-hand.
2 Geared Bar Iron Cutters for 1 in. iron. 2d-hand.
1 48-in. Paterson Forge, complete. 2d-hand.
2 Grindstones and Frames. New.
1 Large Lot Pulleys and Hangers. 2d-hand.
1 Lot Lathe Chucks, different sizes. New.
1 Scroll saw, complete. New.
1 22-in. Rotary Bed Surfacing Machine. New.
1 Saw Bench. 2d-hand.
1 Gauge Lathe. Turns 46 inches long. New.
1 No. 0 Cameron Steam Pump. 2d-hand.

If the list does not contain what you want, write us.

J. M. BADGER.

49 DEY STREET, New York City.

For Sale.

A full line of Hardware, Stoves, Iron and Tinware, centrally located in the largest and best manufacturing city in Northern Indiana. Well established, with an excellent trade. Stock clean; will invoice about $10,000. Address

"X. Y. Z. & Co.,"

Office of *The Iron Age*, 36 Clark St., Chicago, Ill.

Wanted.

By a married man with a large acquaintance with the trade of Minnesota, Dakota, Montana, and part of Wisconsin, also Province of Manitoba, a position to represent Manufacturers of Hardware either on commission or salary, with headquarters at St. Paul or Minneapolis Experience of more than twenty (20) years in the trade.

Address, "M,"

Lock Box 57, Alexandria, Minn.

Satisfactory references if desired.

Wanted.

Position as Chemist in an Iron or Steel works laboratory by a young man. Have worked on Limestone, Iron Ore, Coal, Slag and Silicon, Sulphur, Phosphorus, Manganese and Carbon in Iron and Steel. Can furnish balance and necessary apparatus for work. Address W. M. GIBSON,

Portsmouth, Ohio.

Wanted.

A SALESMAN (acquainted with Hardware) who has an established trade with smaller towns from *Virginia to Georgia.*

dress

"WHOLESALE HARDWARE,"

Box 766, Baltimore, Md.

Special Notices.

CREDITS.

EALY'S "BLUE BOOK,"

JUST PUBLISHED,

contains the names, address, financial standing and paying qualities of over **150,000** dealers in

Hardware, Iron, Metals, Machinery, Cutlery, Guns, Brass Goods, Machinists, &c.,

IN THE UNITED STATES AND CANADA.

This list is NEW, having been carefully compiled within the past three months by over **20,000** Special Local Correspondents and Merchants in the Trade, at an expenditure of many thousands of dollars.

It is guaranteed to be as reliable in every particular as any Reference Book for determining credits can be made, and is much more convenient than the general Agency books, as it is condensed, being confined exclusively to this special branch of trade.

We have reliable and active local correspondents in every City, Town and Village in the United States and Canada, and can furnish subscribers with late and full written reports regarding the character, habits and ability of their customers.

This Agency is devoted to and managed wholly in the interest of this special branch of business.

The "Blue Book" is published twice a year. Terms of subscription, &c. made known on application to either of our offices.

THE JOHN W. EALY COMPANY,

79 Dearborn St., CHICAGO — 51 Chambers St, NEW YORK.

J. SEIDEL,

Commission Merchant.

Box 663,

HABANA, CUBA,

Will be happy to accept the representation of first-class houses manufacturing hardware. Bills paid and collected on commission.

Reference:

COLLINS & CO., 212 Water Street, New York.

THE CLEVELAND Storage Company,

Capital Stock, $200,000.00.

We are prepared to receive **PIG IRON**, Blooms, Ingots, Muck-Bar, **BAR** and Sheet **IRON**, Car Wheels, Rails, **LUMBER, ORE**, &c., also every kind of merchandise, on storage. Warrants will be issued on all stock received, made transferable by indorsement and deliverable to the holder on demand. These warrants will furnish a convenient medium of transfer and delivery, and serve as collateral to parties wishing advances on their stock. We shall be glad to furnish full particulars as to the manner of transacting business, and invite correspondence or personal interview.

W. R. DRAKE, Sec.
Room 35, Merchants' National Bank Building.

For Sale.

An old-established and good-paying Hardware, Paint and Oil Store in a village of 2000 inhabitants. The only Hardware Store in the place; has a large country trade; place growing rapidly; beautifully located on the shores of a large lake in Northern New York near Canadian border; four railroads run into the place. Stock all saleable and in first-class shape; will inventory $7000 or $8,000. Terms cash. Reason for selling, poor health. To the right person this is a big chance. Building the best located in town. Will sell or rent. Will sell stock at once or between now and January 1st. Correspondence solicited.

Address "W,"
Office of *The Iron Age*, 83 Reade st., New York.

For Sale.

In one of the most flourishing cities of the Gulf States, a well-assorted, clean stock of Hardware, Stoves and Tinware. An old well-established business at a good location, with a good run of trade. Stock will invoice $18,000 to $20,000.

Address "SOUTHERN BUSINESS,"
Office of *The Iron Age*, 83 Reade st., New York.

For Sale.

The largest stock of New and Second-hand Engines, Boilers, and general Machinery in the West. Send for Catalogue. Hoisting Outfits for Coal Mining and other purposes a specialty.

WARREN SPRINGER,
195 to 219 South Canal St., Chicago.

For Sale.

Second-hand

DROPS and LIFTERS.

BEECHER & PECK,
Lock Box 222, New Haven, Conn.

Wanted—Partner,

either active or special, with $25,000 to $40,000, to join an established wholesale Hardware business in the West. A good opportunity for party desiring investment.

Address "X,"
Office of *The Iron Age*, 83 Reade St., New York.

CUTLERY SALESMAN.

Wanted by a Sheffield firm of Cutlers, energetic Traveler on commission. State commission, &c. Highest references given and required.

"CUTLER,"
Office of *The Iron Age*, 83 Reade St., New York.

WANTED.

A situation by an experienced man as a Mixer and Melter for Steel Castings; also understands making Steel Ploughshares. Address WM. DAWSON, Steel Melter, Middletown, N. Y.

FIRM of English merchants and manufacturers require, January 1, 1885, an agent in New York, to obtain orders for English Saddlery, Sheep Shears, Chains, General Hardware, &c. Payment by commission. Security and references required. Apply BOX 21 Post Office, Walsall, England.

Trade Report.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, September 4, 1884.

Scotch Pig.—The market is a little firmer. We quote makers' brands as follows:

Coltness, alongside, Glasgow			60/
Langloan,	"	"	55/
Gartsherrie,	"	"	53/
Summerlee,	"	"	52/6
Carnbroe,	"	"	50/
Glengarnock,	"	Ardrossan	49/6
Eglinton,	"	"	44/
Dalmellington,	"	"	47/
Shotts,	"	at Leith	51/6

Lighterage from Ardrossan to Glasgow is 1/ ₽ ton.

Cleveland Pig—Is a little weaker. Quotations are unchanged. We quote as follows, f.o.b. shipping ports:

Middlesboro, No. 1 Foundry			41/
"	No. 2	"	39/
"	No. 3	"	37/ @ 37/6
"	No. 4 Forge		36/

Manufactured Iron.—The market continues irregular. We quote nominally at works:

		£	s.	d.	£	s.	d.
Staff. Ord. Marked Bars		7	10	0	@	.....	.
"	Medium "	6	0	0	@	6 10	0
"	Common "	5	10	0	@	5 15	0
Hoops, 20 W. G. and over.							
"	Common Best	6	15	0	@	.....	
"	Medium	6	5	0	@	6 10	0
"	Common	6	0	0	@	6 7	6
Sheets, 20 W. G. and under.							
"	Ordinary Best	7	15	0	@	8 5	0
"	Common	7	0	0	@	7 10	0
Welsh Bars		4	17	6	@	5 2	6

Steel Rails—Are unchanged. Ordinary Sections are quoted at £4. 15 @ £4. 17/6, f.o.b. shipping ports.

Old Rails—Are unchanged. We quote Old D. H.'s, £3 @ £3. 5/, c.i.f. New York.

Scrap.—The market is unchanged. Heavy Wrought is quoted £2. 10/ @ £2. 15/, c.i.f. New York; Bessemer Crop Ends, run of the mill, are quoted 52/6 @ 54/6, f.o.b. shipping ports.

Copper.—The market is steadier. We quote Best Selected, £58. 10/ @ £59. 10, and Chili Bars, £54 @ £54. 10/.

Tin.—The market is firmer. We quote Straits Ingots, spot, £81. 10/, and futures, £82.

Spelter.—The market is quiet. We quote Ordinary, at shipping ports, £13. 17/6 @ £14. 2/6.

Lead.—The market is lower. We quote Common English Pig, £10. 15/ @ £11.

Freights.—Steam from Glasgow to New York, 3/; Liverpool to New York, 5/; Liverpool to Philadelphia, 5/ @ 6/6, and London to New York, 7/6 @ 9/6.

Financial.

Office of *The Iron Age*,
WEDNESDAY EVENING, September 3, 1884.

Indications respecting the course of trade are of the same equivocal character noticed for some weeks past. With much that is hopeful there are everywhere signs of congestion, especially noticeable in the unprecedented surplus reserves of our moneyed institutions, and scarcely less so in the stoppage of mills, reduced time in the coal regions, a check in the production of petroleum, and a comparatively light movement of merchandise. The movement of wheat is restricted by the reluctance of farmers to sell and the weakness of the export demand at the prices now ruling. A natural consequence is that railroad companies fail to realize their expected earnings, and a "war of rates" is provoked by the fierce competition of rival lines. In other words, the country fails to derive that immediate benefit from abundant crops which lately formed the strongest ground of confidence. Under these circumstances, the conservative course pursued, in the effort to keep production within the limits of demand, is only in accordance with reason. Another influence tending to perpetuate extreme caution in business is the continued feeling of distrust since the money panic, arising from frequent exhibitions of financial rottenness and downright roguery in high quarters, as exemplified in the collapse of the Wall Street Bank and the Bank of Albion, not to speak of the later exploits of Scoville, Pease, *id omne genus*, lately ranking well in mercantile life; and report says "there are more to follow."

Several of our wholesale jobbers in different lines of trade who have been called upon for their views during the past week speak of doing a good business this season, in some instances exceeding that of last year, but buyers are from two to three weeks behind, particularly those from the South, who are generally the first to enter the market. The Western trade is now coming in more actively. Collections are usually spoken of as good. For the retail trade it is yet too early.

The Clearing-House returns for August show the gross exchanges of leading cities in the United States to have been 28.3 % less than for the corresponding month in 1883. In New York the decrease was 32.6 %; outside of New York, 15.55 %; Philadelphia, 26 %; Baltimore, 22.5 %; Boston, 10.2 %.

In business circles during the past week transactions have been comparatively limited, but prices generally are steady, there being fewer radical changes than for some time past, and the speculative spirit is much subdued. The situation, however, is not considered less favorable than one week ago. In cash wheat values are about the same, while options show a slight decline. The interior movement of wheat is called moderate, while the seaboard clearances show up pretty well; the exports from the Atlantic ports last week to Europe were 143,000 barrels flour, 2,765,000 bushels wheat and 263,000 bushels corn, against for the previous week 145,000 barrels, 2,905,000 bushels and 214,000 bushels respectively. Coffee is quiet. Cotton is slightly improved; quotations steady. India-rubber has a firmer tone. Leather is in better demand. Molasses dull and nominal. For lard oil there is a steady market. In provisions prices are barely sustained. Sugar is quiet on a nominal basis. Teas are strong for Formosas and Amoys and blacks have advanced fully 3¢ @ 5¢ ₽ lb. Tobacco is firm. Wool unchanged. Ocean freights are depressed, tonnage being in excess of requirements.

On the Stock Exchange during the past week the market has been spiritless and unsettled. Prices fell off until Friday, when an attempt to cover shorts in Union Pacific, the grangers' and trunk lines caused a sharp advance. On Saturday speculation was more active at advancing figures. Some London buying was reported, and advices respecting the corn crop were very promising. On Monday there was a break, under the pressure to sell long stock, and labor troubles in the West were given much prominence. On Monday New York Central and Louisville and Nashville were conspicuously weak, affecting other shares in sympathy, and to-day, while there was more steadiness, the general situation was unchanged. Quotations as follows: Delaware, Lackawanna and Western, 107⅞; Denver and Rio Grande, 11⅞; Illinois Central, 124; Jersey Central, 58½; Northwestern, 98; Northern Pacific preferred, 48⅜; Oregon and Transcontinental, 15⅝; Reading, 26¼ St. Paul and Manitoba, 94¼; Erie, 15½; Missouri Pacific, 91⅝; Ontario and Western, 11¾; Pullman Palace Car, 112½; St. Paul and Omaha, 93¼; Texas and Pacific, 12⅞; Northwestern, 96⅞; Lake Shore, 79⅝; Louisville and Nashville, 29¼; Milwaukee and St. Paul, 82; Union Pacific, 47⅝; Western Union Telegraph, 63½; Delaware and Hudson Canal, 96.

United States bonds closed as follows:

	Bid.	Asked.
U. S. 3 per cents	100⅜	100¾
U. S. 4½s, 1891, coupon	112	112⅛
U. S. 4s, 1907, coupon	120⅛	120¼
U. S. Currency 6s, 1895	125	—
U. S. Currency 6s, 1896	127	—
U. S. Currency 6s, 1897	129	—
U. S. Currency 6s, 1898	131	—
U. S. Currency 6s, 1899	132	—

The imports of foreign merchandise at this port during the past week were nearly $700,000 above those of the previous week, the total amounting to $8,382,119, of which $5,118,119 represents general merchandise, and the remainder, $3,263,233, dry goods. Since January 1 the total is $296,181,000 compared with $313,368,341 for the corresponding period of 1883. The exports of domestic produce from this port during the past week were rather light, the total being but $5,945,162, against $7,172,696 for the same week last year. The shipments of wheat continue large, but other principal items are moving out but slowly. Since January 1 the exports aggregate $212,603,969, against $241,002,506 for the corresponding time in 1883. According to the Custom-House reports the imports of specie at this port for the week were $257,843, of which $156,283 was in gold, making a total of $12,698,256 since January 1, and the exports of specie for the same time amounted to $238,156, nearly all in silver, which makes the total specie exported since January 1 $47,344,627.

The weekly bank statement, aside from a decrease of $549,175 in surplus reserve, shows no important changes. The loss from the absorption of money by the Treasury and shipments West and South was much less than was expected. The surplus now stands at $31,100,375, against $6,224,025 at the same time last year, and $156,000 below the corresponding date in 1881. The market continues easy, the supply of loanable funds being increased by interest disbursements since September 1. The United States Treasury reports, as well as the recent call for bonds, indicate that no uneasiness is felt respecting the supply of gold. The amount of public debt was reduced $8,500,000 in August, and bonds were redeemed to the amount of $7,300,000. Since July 1st the beginning of the fiscal year, the redemption of bonds aggregates $15,500,000, or at the rate of $90,000,000 per annum, and this despite unusually large demands on the Treasury, including the extraordinary payment of $2,500,000 on account of the Geneva award. During August the cash in the Treasury increased from $406,000,000 to $414,000,000, owing chiefly to the deposit of gold and silver for certificates, and it is believed that the increase of gold bullion will continue through the autumn months. The gold and silver certificates have increased $25,000,000 since the beginning of the fiscal year, and now amount to about $242,000,000, in nearly equal proportions. As a further ground of assurance in respect to the currency, it is remarked that the supply of silver ores is not so plentiful.

Statistics of the foreign grain trade of this port for the last six months show that British vessels as carriers lead all others. The total shipments for the period named exceed 20,000,000 bushels, and the heaviest were made in June, the amount taken out at that time having been about 5,000,000 bushels, while in April nearly 4,000,000 bushels were exported and in May 3,200,000. The whole number of British vessels engaged in the trade was 312; Germany comes next, and then Belgium, France, Holland and Italy. The falling off in shipments compared with the corresponding period last year is about 4,500,000 bushels.

A representative meeting of the paper-stock importing trade was held on Tuesday, at which about 40 firms were represented and a committee was appointed to try to secure a modification of the recent order prohibiting rag importations. Meanwhile there are literally no quotations for rags, on account of the divergence of views among dealers. Unless relief is obtained a sharp advance in prices is predicted.

Mr. Charles J. Osborne is appointed receiver of the Wall Street National Bank and ordered to pay 60 per cent. to the depositors out of the $702,000 on hand.

The court has declared the appointment of Receivers Russell and Houston, of West Shore, to have been irregular and void, but reappoints Russell as receiver.

There were 169 failures in the United States reported to *Bradstreet's* during the week, against 208 in the preceding week, and 126, 110 and 104 in the corresponding weeks of 1883, 1882 and 1881 respectively.

Wallace's Saving's Bank, at Newcastle, Pa., closed their doors, with $100,000 liabilities and assets "not worth mentioning." A savings bank at Adrian, Mich., not having the funds on hand to cash a $1500 check, were by a resulting run compelled to suspend.

The new cotton year began September 1. At this port the receipts last year were 1,125,276 bales, and the exports 657,213 bales, the balance going to the spinners. The total crop of the past year is estimated at nearly 5,700,000 bales.

Metal Market.

Copper.—Sales for the week amounted to 100,000 lb Lake Superior at 14¢, other brands ranging between 12½¢ and 13½¢, some 25,000 lb Baltimore being reported sold at 12¾¢ from second hands. Nothing has transpired between the Lake companies and the manufacturers' pool. The latter are perhaps in hopes of buying at 13¢. At 13½¢ the Lake companies would, we believe, be prepared to sell them. A sale to European exporters the companies would like best at this juncture, and accept considerably less, for purposes of export probably, than they would for domestic use. They say that if manufacturers want Lake Copper there is no reason why they should get it so very cheap; that the demand for Copper Wire for electric purposes is unusually heavy, present and prospective, and that if the Franco-Chinese war continues there will be a large cartridge demand to boot, pretty surely. Hence they feel quite strong, and not without good reasons, apparently. Manufactures may be nominally quoted as under: Bottoms, 20¢; Braziers, 20¢; Sheathing, 18¢, and Bolt Copper, 20¢. Best Selected has been £58. 10/ the last few days, and Chili Bars were cabled £54 yesterday and this morning; this afternoon we receive from London the ensuing cablegram: "Market steadier. Best Selected, £58. 10/ @ £59. 10, and Chili Bars, £54 @ £54. 10."

Tin—London having dropped for a moment to £81. 10/ with Straits Tin, our market became quite unsettled and weak, giving way to $18.15 cash, but since then London has become active, spot Straits being quoted this morning £82. 5/, and three months £82, on the receipt of which news our market righted to 18¼¢ @ 18⅜¢, at which it closes. On August 29 Messrs. Van Lennep & Chevalier, 120 Front street, New York, received from Messrs. Dummler & Co., Batavia, Java, whom they represent as agents, the following cable message: "The Batavia Billiton Tin sale to-day averaged 55.75 guilders ₽ picul, equal to £84. 5/ cost and freight ₽ ton to New York by steamer via Holland." In August, according to Mr. Charles Nordhaus, E. I. agent, 13 Cedar street, New York, there were shipped from the Straits' settlements to the United States 250 tons of Tin, against 900 last year, and to England 1500, against 420. Total export to the United States, eight months: 2530 tons, against 4965 in 1883, and to England 8295, against 5440; grand total, 10,825 this year, against 10,405 last year. From the same gentleman we receive the valuable local monthly statistics below:

		Tons.
August stock of tin on this coast		700
August arrivals		1,600
Total supply		2,300
Less August consumption		800
September 1, stock		1,500
Add afloats:		
From the Straits	850	
" Europe	200	
" Australia	100–1,150	
September 1, visible supply		2,650

We are cabled from London this afternoon that the market is firmer, with Straits, spot, £81. 10/, and futures £82. *Tin Plates* have ruled dull and partially easier. Charcoal Ternes have been unsettled. The market closes flat, and may be quoted as follows for large lines, ordinary brands, ₽ box: Charcoal Bright, $5.20 @ $5.60; do. Ternes, $4.65 @ $5; Coke Tin, $4.85 @ $4.90, and do. Ternes, $4.35 @ $4.50. Liverpool quotes per cable, Charcoal, 17/ @ 18/6, and Coke, 15/3 @ 15/6.

Lead.—No sales beyond a small jobbing business have been made, and these small parcels Common Domestic have gone at $3.55. At $3.50 there would probably be some takers. Corroding is offered at $3.60, and less desirable lots may be had at $3.55. The market, as it stands, is inactive and flat. We cannot see that anything but speculation can help it. Chicago is down to $3.37½, and St. Louis to $3.35. Manufactures are quoted as follows: Lead Pipe, 5¼¢ ₽ lb: Sheet Lead, 6¼¢; Tin-lined Lead Pipe, 15¢, and Block-Tin Pipe, 10¢, allowing in trade for Old Lead delivered in New York 3¢ ₽ lb. Shot: Drop, 6¢; Buck, 7¢; Chilled, 7¢. Shot in 5-lb bags, 1¢ ₽ lb extra. We receive the ensuing cable dispatch from London: "Market lower. Common English Pig, £10. 15/ @ £11."

Spelter and Zinc.—The same listless state of affairs hitherto noticed has prevailed during the week, the demand for Common Domestic being very moderate and met at $4.60 @ $4.65. Silesian is neglected and nominal. Bertha Refined we quote 8¢.

Sheet Zinc—Meets with seasonable inquiry at 5⅝¢ @ 5¾¢, Domestic. From London we are cabled that the market is quiet, with slightly lower quotations

Antimony—Moves off slowly, but steadily, at 10¼¢ for Hallett, and 10¼¢ @ 11¢ for Cookson in a small way.

Coal.

The Anthracite Coal trade is demoralized under excessive production. The stoppage of six days this week will in its practical effect reduce the surplus at shipping points, but meanwhile there is no uniformity of prices among wholesale dealers, each party shading the circular as may best serve individual interests. There is a prevalent belief that a further suspension will be agreed upon, in accordance with the plan hinted at in these columns three weeks ago. At Elizabethport Free-burning Stove is selling at 60¢ off, and Broken has been cut about 30¢. In New York Chestnut is shaded from about 50¢ to $1 ₽ ton. Lump Coal appears to be the only size for which the circular price is firm. The variation from official prices, therefore, is 15¢ @ $1 ₽ ton, according to quality and quantity.

The Pottsville *Miners' Journal* says: "It was supposed early in the year that the quantity needed to supply the demand would be only about 1,000,000 tons less than that of last year, but, as the year advances and the trade has reached the period which is usually the most active, it is seen that this was an extravagant estimate. The continued prostration of the Iron trade, the very low prices of Bituminous, and the dullness in many branches of manufacturing, have had the tendency to decrease the demand for Anthracite, and there will be a wider difference between the marketed production of last year and this than 1,000,000 tons."

Bituminous Coal is in its usual lethargic state. About $3.30 for Cumberland, f.o.b. at Amboy, is a fair quotation, although offers are made at a much lower figure. Work at the mines is undisturbed, difficulties in the West having no influence here.

The total amount of Anthracite mined thus far in the year 1884 is 17,925,324 tons, compared with 18,937,083 tons for the same period last year. The total amount of Bituminous sent to the Eastern markets thus far in the year 1884 is 3,452,521 tons, compared with 3,150,023 tons for the corresponding period last year.

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy	₽ lb.	$0.10	@	.....	
" light	"	.08	@	.....	
Copper Bottoms	"	.08	@	.....	
Yellow Metal	"	.07	@	.....	
Brass, heavy	"	.06½	@	.07	
" light	"	.05½	@	.06	
Composition, heavy	"	.09	@	.....	
Lead, heavy	"	.02¾	@	.....	
Tea Lead	"	.02½	@	.....	
Zinc	"	.02½	@	.02¼	
Pewter, No. 1	"	.17	@	.....	
" No. 2	"	.08	@	.....	
Wrought Iron	₽ ton,	18.00	@	.....	
Light "	"	10.00	@	.....	
Stove Plate Iron	"	10.00	@	10.50	
Machinery "	"	13.00	@	.....	
Grate Bars	"	4.00	@	.....	
Stereotype Plates	₽ lb.	.04	@	.....	
Electrotype "	"	.03¼	@	.....	
Small Type	"	.05	@	.05½	

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen	₽ lb.	3½	@	4 ¢
" Cotton	"	3½	@	...¢
" No. 2	"	2½	@	2¾¢
White, No. 1	"	3½	@	4 ¢
" N 2	"	1¾	@	2 ¢
Seconds	"	½	@	1 ¢
Soft Woolens	"	4	@	4½¢
Mixed Rags	"	1½	@	1¾¢
Gunny Bagging	"	1¾	@	1⅞¢
Jute Butts	"	1½	@	1¾¢
Kentucky Bagging	"	2¾	@	2¾¢
Book Stock	"	1½	@	1¾¢
Newspapers	"	1	@	..¢
Waste Paper and Scraps	"	½	@	..¢
Kentucky Bale Rope	"	3½	@	4 ¢

A riot occurred on Sunday morning last in the Hocking Valley of Ohio, which was precipitated by the striking coal miners. It is reported that a large number of miners, who came in from the surrounding country, made an attack on the force of men employed in guarding the mines. One of the hoppers was burned, entailing a loss of $4000. Shooting was commenced by the rioters at 2 a. m., and continued about an hour. The firing was general, and not less than 600 or 700 shots were fired. One of the guard was shot dead without provocation and while pleading for mercy, and two others were wounded. Governor Hoadly, of Ohio, was called upon for troops to suppress the rioters, but he visited the scene of conflict in person to endeavor to restore tranquillity without resorting to violent measures. At this writing his efforts seem to have met with success.

Trade Report.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, September 2, 1884.

Pig Iron.—The market shows no material change from last week, the demand being fair at the figures then quoted. As a rule, consumers have confined their purchases to small lots, although in a few instances transactions have been somewhat heavy, special prices having been made in order to secure the buyer. Taking the market all the way through, it may be said that prices have held their own, while sales have probably been a trifle beyond the average. Indications are favorable for the near future also, and, although there is no reason to think there will be any material improvement, it seems to be pretty well settled that the lowest point of depression has been reached, and that at least a steady market may be looked for during the next three months. This opinion is based upon the fact that stocks are light, the disposition to buy somewhat stronger, while the anxiety for orders and the willingness to shade prices has decreased in proportion to the improved demand. Continued activity would, of course, soon lead to an advance in prices, but there is no reason to suppose that there is anything likely to influence the market to that extent. Contracts are being renewed or are under negotiation, and, as usual at this season, everybody seems to require more or less Pig Iron, but, so far as can be seen, there is nothing whatever to warrant the idea that consumption is going to be larger than it has been during the past 10 or 12 months. This is the general feeling in the trade, and while some improvement is confidently anticipated, following good crops, sellers are quite satisfied, in the meantime, to accept business on the present basis of values, say from $19.50 to $20 for No. 1 Foundry Irons, and $17 @ $18 for Mill Irons, all delivered at tide. In exceptional cases business has been done at from 50¢ to $1 beyond the highest figures named, and in others at as much below the lowest, according to brand, quantity, terms of payment, &c. Choice brands of No. 1 Foundry, for instance, command $20.50 @ $21, while others not strictly up to grade, or not generally known to consumers, have had to go at $18.50 @ $19. Mill Irons by the same rule have sold down to $16 and $16.50, while special brands still command $18 at furnace. Some large lots of cheap Irons have been picked up during the week, perhaps 10,000 tons in all, leaving the market in somewhat better shape as regards this particular grade, while others are steady, if not firm.

Foreign Iron.—Bessemer sells in lots of from 100 to 250 tons each at $20.50 @ $21 for special brands, but there is no inquiry whatever for large lots, which are quoted at $19 @ $19.50 asked. Speigeleisen is also very dull, with $27.50 asked for shipments of 20 %, and $23 @ $23.50 for 10 % to 12 %. Ferromanganese is taken in small quantities at about $74 @ $75 for 80 %.

Muck Bars.—There is only a moderate business doing, prices being barely steady at figures quoted a week ago. Bars made from inferior pig can be had at very low rates, but for guaranteed qualities $29 @ $30 at mill is quoted, according to location, &c.

Blooms.—Demand slow at irregular prices. Ordinary qualities can be bought considerably under quoted rates, but for best makes prices are steady as last quoted, viz.: Charcoal Blooms at $53 @ $55; Run-out Anthracite, $43 @ $45; Scrap Blooms, $40 @ $42; Northern Ore Blooms, $38 @ $40.

Bar Iron.—The market remains in the same dull and unsatisfactory condition as before. There is a little more inquiry, probably, but the volume of business shows no increase of importance. Orders for large lots are seldom on the market, so that manufacturers have to depend upon what comes in from day to day. This is barely sufficient to keep things moving, and, in the desire to secure as much as possible, prices are cut to very unsatisfactory figures. Best Refined Iron is nominally about 1.9¢, but some mills are quoting lower than that, and on desirable orders it is not unlikely that even the best makers would shade a trifle. Common Iron can be had from 1.6¢ upward, according to quality, but the demand is chiefly for the best Iron.

Plate and Tank Iron.—The demand is about same as last week, which is barely sufficient to keep the mills employed. There is nothing to indicate any special change in the near future, and prices are somewhat irregular at the following prices asked: Plate Iron, 2.1¢; Tank, 2.15¢ @ 2.25¢; Shell, 2.75¢; Flange, 3.75¢; Fire-Box, 4.25¢.

Structural Iron.—New orders have been very scarce of late and manufacturers are running close toward the end of their contracts. Small orders are somewhat numerous, but they are not equal to the output by any means, so that new business is sharply looked after. The outlook is not encouraging, as both bridge and ship builders have very little new work coming in, so that two of the most important interests are pretty nearly out of the market. The newspapers have referred to a contract taken by the Phœnix Iron Company for an elevated railway in Brooklyn, but work may not be commenced for some time yet, so that it has not had (nor is it likely to have) any special influence upon the market, although the contract is one of considerable importance. Meanwhile prices are about as last quoted; say, 2.1¢ for Angles, 2.25¢ for Bridge Plate, 2.75¢ for T's and 3.5¢ for Beams and Channels, subject to the usual discount on large lots.

Sheet Iron.—Market very disappointing to manufacturers, and prices somewhat demoralized by the offerings of low-quality and low-priced Sheets. For the best makes prices are unchanged, and for small lots may be quoted as follows:

Best Refined, Nos. 26, 27 and 28	4 ¢
Best Refined, Nos. 18 to 25	3½¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	6¼¢
Best Bloom Sheets, Nos. 22 to 25	6 ¢
Best Bloom Sheets, Nos. 16 to 21	5¼¢
Common Red Plates, 3-16 to 16	2½¢
Blue Annealed	2.8¢
Best Bloom, Galvanized, discount	50 %
Second quality, discount	52½ %
Common, discount	57½ %

Wrought-Iron Pipe.—This branch of trade continues dull and prices weak. The combination discounts are nominally the ruling figures, but it is difficult to discover a general price. The market is in such an uncertain state that buyers prefer to await developments, and in the meantime take only small quantities as needed. We quote as before, viz.: Butt-Welded Black Pipe, 30 %; Butt-Welded Galvanized, 20 %; Lap-Welded Black, 50 %; Galvanized, 35 %; Boiler Tubes, 47½ %.

Steel Rails.—Inquiries for large lots are reported and prices are decidedly firmer. A considerable number of orders have been entered at $27 at mill, and more business is offered at same figure, but manufacturers ask $27.50 unless the order is a specially desirable one. The tendency is toward improvement, and it looks as though the lowest point had been reached.

Steel Slabs.—The demand is fair and prices steady at about $36 @ $36.50 at mill.

Old Rails.—The market is quite bare of stock for prompt delivery and prices a trifle dearer. A lot of 300 tons sold to-day at over $18.50, Philadelphia, and holders ask $19 @ $19.50 for the one or two little lots available for spot delivery. Shipments could be had possibly at $18 on firm offers, but the feeling is a shade firmer all around.

Scrap Iron.—Prices have been very irregular, and, on the whole, a trifle easier. Sales—Choice No. 1 Wrought, f.o.b. cars, $20 @ $20.50; Turnings do., $15; cargo lots Foreign Scrap, $18 @ $18.50; Cast Scrap, $15 @ $15.50; and Turnings, about $10.

Nails.—There is little change in the situation. The demand possibly shows a slight falling off, but, on the whole, trade during August was equal to that of the same period last year. Steel Nails are becoming quite a factor in the market, although their sale is limited by the present difference in price. However, if that is removed by a reduction in cost, a more active competition may be looked for. In the meantime it is difficult to quote with accuracy; $2.15 @ $2.30 seems to be the range, with the majority of sales at about $2.20.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, PA., September 2, 1884.

There has been no improvement in the general Iron business during the past week; on the contrary, the situation, instead of getting better, appears to be growing more discouraging. Reports from nearly all points, both West and South, indicate that depression is the order of the day. There appears to be a general disposition to hold off to await more fully the course of events. People everywhere appear to be economizing, being impressed with the idea that the coming winter is destined to be a hard one, and the masses, as a rule, are buying nothing they can do without. This, of course, affects all branches of trade unfavorably, and Pittsburgh manufactures of all kinds are feeling the depression in common with everything else. There is considerable of a flurry in gas-well supplies, but it is mainly local, and consequently does not amount to much, so far as the manufacturers of the same are concerned, although but for this gas-well flurry our Pipe mills would have had ere this to shut down. A number of the recently-organized companies are pushing the work with considerable energy. The company that bought the McGoughen well have already reached the city with their pipes, and commenced supplying Painter's Iron Mill with gas last week. At Washington (Pa.) the citizens are being supplied with gas at the rate of $12 per year for a cooking stove and $8 per year for each grate, and nearly all the people there are taking it

The great event of the past week was the raising of the wickets in the Davis Island Dam. This dam, when fully completed, as it will be, it is expected, by the advent of winter, will afford a good stage of water in our harbor the year round. The dam is located about six miles below the city, in the Ohio River; it is the only one of the kind in this country, and, if we mistake not, the largest in the world. It is what is called the Chanonine system; in high water the wickets can be lowered and there will be no dam, while, when the water is lower, they will be raised, affording a good stage of water not only here in our harbor, but for two or three miles above. The effect of this will be to cheapen transportation to those of our manufacturers whose works are located on the river banks, as many of them are. There was a strong feeling against this dam when it was first projected, especially among our Coal men, but if it proves a success, of which there is little doubt, no class of men will be benefited more than these same Coal men

Iron Ore.—Advices from the Lake region continue of a discouraging character. The movement at Cleveland continues light; the few purchases made are small and the stock on the dock is steadily increasing. Prices are still quoted as before, but they are weak and might be shaded, although Ore men say they are making no money.

Pig Iron.—Dullness is still the order of the day, and, while an improvement soon is looked for, the prospect is not very encouraging. Demand, as a rule, is still very light; consumers with few exceptions are refusing to buy beyond their immediate actual wants, and it looks as if this hand-to-mouth policy was likely to be adhered to for some time to come. Now and again we hear of a mill owner who is inclined to contract for a round lot, but it is found on investigation that he wants some well-known brand at from 50¢ to $1 ℔ ton below market price. Production not only here but throughout the West continues light, and stocks are below an average, but considerably in excess of present wants, which are unusually light for the season. Probably but little over one-half of our puddling capacity is employed at the present time, and the prospect is not by any means as favorable for an increased consumption as could be desired. Quotations may be fairly given as follows:

Neutral Gray Forge	$16.00	@ $16.50,	4 mos.
All-Ore Mill	17.00	@ 18.00,	4 "
White and Mottled	15.00	@ 15.50,	4 "
No. 2 Foundry	17.50	@ 18.00,	4 "
No. 1 Foundry	19.00	@ 20.00,	4 "
Cold-Blast, Charcoal	25.00	@ 28.00,	4 "
Bessemer Iron	18.25	@ 18.50,	4 "

Muck Bar.—There have been no sales reported for several weeks, in the absence of which we continue to quote at $29 @ $30, cash, at mill.

Manufactured Iron.—There has been nothing particularly new developed during the past week; trade continues very dull for the season, and prices unsettled and unremunerative. Some mills are idle in all departments, others are running single turn, and we do not know of a single one that is being worked up to its full capacity. We continue to quote good makes of Iron on a basis of 1.65¢ @ 1.75¢ rate for Bars, but poor stock is being sold on a lower basis. Skelp Iron is quoted at 1.75¢; but for the Skelp Iron trade, some of the mills now running would have nothing to do.

Nails.—The Nail trade is still reported dull, and it begins to look as if jobbers intended to adhere closely to the hand-to-mouth policy during the remainder of the year. Orders are chiefly small, and it is evident that jobbers have an idea that prices will rule lower later on in the season, and, until relieved of this apprehension, no improvement in the demand can reasonably be looked for. We continue to quote at $2.10, 60 days, for carload lots and upward, and 5¢ @ 10¢ ℔ keg additional in a jobbing way.

Wrought Iron Pipe.—There is a continued fair local trade, occasioned by the putting down of the numerous gas wells and the laying of pipe to utilize the same, but aside from this there is but little doing. Prices continue weak and irregular, and since the collapse of the combination buyers have had the advantage; in other words, cutting is still the order of the day. Discounts are quoted as follows: On Black Butt-Welded Pipe, 40 %; Galvanized do., 35 %; on Black Lap-Welded Pipe, 60 %; do. Galvanized, 45 %; Selected Pipe, or Pipe cut to specified lengths, discount 5 % less than the rates quoted; 2-inch Oil-Well Tubing, 13¢ ℔ foot, net; 5⅝-inch casing 45¢ ℔ foot net.

Steel.—Manufacturers continue to report business very dull and unsatisfactory, but few, if any of them, running full. Prices remain as last quoted, although desirable orders would no doubt be shaded. Best brands of Refined Cast Steel, 9¼¢ @ 9½¢; Crucible Machinery, 5¢ @ 5½¢; Bessemer and Open-Hearth do., 3¢ @ 3¼¢.

Steel Rails—Are still reported dull, and while, so far as we can learn, no sales have been made here below $28, cash, at mill, sales have been made elsewhere at lower prices.

Old Rails—Continue dull, and prices are weak; we hear of sales at $20 @ $20.25 and $20.50. Some of the largest consumers are out of the market entirely; hence it is difficult to effect sales at any price.

Crop Ends.—We can report a small sale at $18.25, which appears to be the ruling price.

Railway Track Supplies.—Prices are still quoted the same as for some time past, but desirable orders are no doubt being taken at a considerable cut from the prices quoted. Spikes are still quoted at 2.35¢, 30 days, but they can be bought at that price delivered at almost any point in the country.

Scrap—Of all kinds continues dull. No. 1 Wrought is still quoted at $19@ $20, ℔ net ton; Wrought Turnings, $16 @ $17; Old Car Axles, $27 @ $28; Cast Borings, $12 @ $12.50, gross; Old Car Wheels, $16.50 @ $17.

Window Glass.—Discounts on Single Strength, in car lots, 60 and 20 %; less than car lots, 60 and 10 %; Double Strength, 70 and 10 % for car lots, and 70 % for less.

Coke—Continues dull, and, notwithstanding nearly one-half of the syndicate ovens are idle, the supply is in excess of the demand. Prices remain unchanged. Blast Furnace Coke, $1.10 ℔ ton, free on cars at ovens.

Chicago.

Office of *The Iron Age*, 36 and 38 Clark St., Cor. Lake St., CHICAGO, September 1, 1884.

Hardware.—As the season advances trade in Hardware continues to improve. Each succeeding week shows some improvement over its predecessor. In glancing through the shipping departments of our large jobbing houses from time to time, we notice with interest the additions in goods demanded by consumers. During the past week there has been an increased demand for Stove and Sheet Iron Wares, and considerable call for Strap Hinges, Butts, Screws, Locks, Window Glass and Willow Ware. Articles that were prominent in the demand among spring orders have gone out of notice, and goods for fall and winter utility have taken their place. Upon the latter a steady growth in consumption is looked for. Consumers are anticipating their ability to spend more money than a year ago, and the retail merchant is extending his line of purchase accordingly. Much caution is exercised in making out his order, and the judgment of the jobber on higher or lower prices greatly relied upon. Jobbing houses with established reputation for honor and fair dealing are having the advantage in sales at present, as much of the business comes in on "open orders" without solicitation, and are largely at the discretion of the house with whom they are placed as to quantity and price. Higher prices are not expected, but the regularity in demand and confidence expressed by the suburban trade give a better tone to the market and place it in a more favorable position than it has been in for the past year.

Barb Wire.—There is an improvement in the demand for Barb Wire since our last report. Considerable inquiry for carload lots comes from the Southern and Western territory, with an occasional sale of good round lots. Numerous statements as to stock on hand are given out, but the most reliable seems to be that there is sufficient Barb Wire now in stock to meet all requirements for fall trade. Manufacturers are silent as to what course they will pursue, while rumors have it that they will remain idle for a while, in hope of getting better prices. Galvanized is quoted at 5¼¢ and Painted at 4¼¢, as heretofore.

Nails.—The position of the Nail market is about the same as a week ago. There has been, perhaps, a slight improvement in the demand, but nothing which points to an active trade. There is no confidence as yet that Nails have touched the lowest figure that may obtain, and business is restricted to actual consumption. For carload lots $2.20 has been named, with the usual 2 %, 60 days, discount as the ruling price, and in all probability was fairly adhered to by jobbers. From the small trade $2.25 @ $2.30 is required, but the stability of the figures is uncertain. Steel Nails are offered to jobbers at 15¢ ℔ keg advance on the price of Iron Nails.

American Pig Iron.—The market during the week has assumed a steadier appearance than at any time within the past fortnight. The unsettled feeling that resulted from the decline of two weeks ago is not visible, and prices are reported stronger and regular. It has become a familiar saying that Chicago is the "dumping ground" for all surplus stock. When furnaces in other districts fail to rid themselves of their accumulated stock at home and need ready cash they come to this market and cut prices sufficiently to admit of unloading. Such was the case with the recent transactions which brought the price of Southern Iron down $2 ℔ ton in one week and broke the market price on the whole line. Fortunately, however, Chicago is so situated that it supplies a large scope of country with raw material, and, therefore, does not remain illegitimately depressed for any length of time. During the week Southern Iron has recovered from weakness to strength, and advanced 50¢ ℔ ton on No. 2, with No. 1 held firm at quotations. Charcoal Irons are also stronger, without change in price. The tone of the market is greatly improved and some are so sanguine of its position that they claim an advance will be made before the close of the present week. The scarcity of Charcoal Iron is said to be the basis for the feeling which has seized the market and is evidently creating a strong movement toward better prices. The demand for the week was fairly satisfactory. Many of those who have been holding off for lower figures have closed their contracts, and in one or two instances were compelled to pay a trifle more for their Iron than would have been accepted three weeks ago. The following quotations are given as firm for carload lots, four months: Lake Superior Charcoal, Nos. 1, 2 and 3, at $21 @ $21.50; Nos. 4, 5, and 6 at $22; Lake Superior Coke at $20; Lake Superior and Ohio, mixed, at $20 @ $21; Ohio Standard Black Band, No. 1, at $21; Southern, No. 1, at $18; No. 2 at $17; Silvery Soft at $17.50 @ $19 50; Anthracite, No. 1, at $21, and No. 2 at $20; Bessemer Pig, $18.75.

Scotch Pig.—The market for Scotch Iron has of late been receiving more attention than for months past. The enormous amount of American Softeners that have been put upon the market during the year had so obliterated the market for Foreign Iron that buyers were scarce and the demand exceedingly light. The low figures at which Scotch Iron is being sold, and the miserable quality into which some of the American brands of Scotch have degenerated, have revived the demand for imported Softeners and made the trade of considerable importance. Many of the Stove-makers have again begun using it, and the majority of the Reaper and Mowing Machine manufacturers are contracting for a supply during the year. On the two brands now sold we make the following quotations: Summerlee, $25.50, cash, from yard, and $24.50 to arrive; Glengarnock, $25.50 from yard, and $24 to arrive.

Merchant Steel.—The makers and jobbers continue to report a fair demand for the better grades of Steel, with no change in that for low grades. Throughout the market is not very encouraging for an extended trade. Much of the demand comes from those who make yearly contracts, and to lose the contract is to lose the business for a year, and thereby lessen transient trade to that extent. Makers of good brands claim that there is no money in accepting these contracts at the prices demanded by buyers, but to leave all pass is to be without work eventually. The remedy suggested is to accept the contracts and to reduce the quality to correspond with the price. The demand for Toe-Calk Steel has been very good several weeks past. Syndicate Steels are still quoted at 7¢ @ 7½¢. For the Best Refined grades from store we make the following quotations:

	Per pound.
Best Refined Cast Tool Steel	9 @ 10¢
Crucible Cast Machinery Steel	6¼ @ 6½¢
Open-Hearth Machinery Steel	3¼ @ 3½¢
Bessemer Machinery Steel	3 @ 3½¢
Open-Hearth Spring Steel	3¼ @ 3½¢
Toe-Calk Steel	3¼ @ 3½¢
Bessemer Steel	2½ @ 3 ¢
Fire-Box and Boiler Steel	5 @ 5¼¢

Steel Rails.—There is considerable inquiry for lots of Rails, ranging from 5000 to 10,000 tons, but the position of makers on these inquiries is difficult to determine. One lot of 10,000 tons was sold during the week at $30, Chicago, which appears to be about market price. Other sales have been made, but prices could not be learned. It is pretty certain, however, that mills out of work will meet the prices made by Eastern mills, with freight added. The placing of orders and the price depend entirely upon the condition of the rolling mills.

Old Rails—Are quiet and the market price $17 @ $18, as heretofore. Old Steel Rails are quoted at $15, and no demand.

Structural Iron.—Business from stock continues very fair, and the aggregate trade thus far is somewhat above that of a year ago. New contract orders are becoming less in number every week, and the season's business is rapidly drawing to a close. We continue the following quotations, with ¼¢ @ ½¢ added for delivery from stock: Beams, $3.60; Channels, $3.60; T Iron, $3; Angle Iron, $2.50; Flitch Plates, $2.50; Frieze Plates, $2.70.

Bar Iron.—There continues to be a steady trade doing in New Puddled Refined Iron. The market for this Iron has not suffered much from the fluctuations in other Irons in the past three months, and as the demand for fall work is pretty fairly established it is not likely that any change for the worse will occur. Prices are firm at $1.90 @ $2, and no disposition to discount these rates has been discovered. Common Iron has been in better request of late, but the uncertainty in quality and the strong competition keep the market unsettled and prices very low. From mill quotations range from $1.60 to $1.70, and from store $1.75 to $1.80.

Norway Bars.—Trade in this class of Iron is improving. The demand from retail merchant trade has greatly increased at the reduced price, which is $3.75. Store trade is also somewhat better and continues to be served at 4¢ rates.

Galvanized Iron.—For the week the market was fairly strong in demand for small lots from store. From mills a better trade is reported from the cornice trade in the Southern States in carload lots, and also from the jobbing trade in country towns further west. There is not much to look for at this season of the year from outdoor consumption beyond the present steady demand. The combination price holds firm, and the following are quotations from jobbers. We make the following quotations: Juniata, 52½ % off; Charcoal, 55 % off, and Refined, 57½ % off.

Black Sheets.—The market for Black Sheets has not improved any during the past week. The jobber's price here seems to be about 20¢ less than he can replace his stock. No one of the jobbers is willing to sell more than from 1 to 10 bundles to any one person, and even then feels that he is only accommodating his customer, in the hope of making it up on other goods. There is no other market in the country where Black Sheets can be bought as low as in Chicago to day. Manufacturers are stiff and unwilling to meet the emergency of the jobber, whose stock is about exhausted. Within a few days we learned of one concern having offered $2.90 on 3000 bundles No. 27, and the mill refused the offer, their price being $3. We quote No. 27 at $3.20 from store, which is the established asking price, but sales have been made at from 10¢ to 20¢ less than that figure, through the energy of jobbers in trying to undersell each other. We quote as follows from store: Nos. 10 to 14 at $2.60 @ $2.70; No. 24 at $3; Nos. 25 and 26 at $3.10, and No. 27 at $3.20.

Old Wheels.—The demand for Wheels is not very strong, but for such inquiries for small lots as are in the market we quote $17 as foundry price. For an order of 200 or 300 tons this price would not be accepted, as dealers are holding the bulk for better figures.

Scrap Iron.—There is no change in the market for old Scrap Iron. Prices continue weak, and stock in better supply than demand requires. Mills quote $15.50 @ $16 for No. 1, and $11 @ $12 for No. 2, Chicago or Milwaukee delivery. We make the following quotations as dealers' purchasing prices: No. 1 Wrought Scrap, ℔ net ton, $15; Cast Scrap, ℔ net ton, $12; No. 1 Stove Plate Scrap, ℔ net ton, $8; Wrought Turnings, ℔ ton, $8; Cast-Iron Borings, $6; Old Plow Steel, $9; Tool Steel, ℔ ton, $15; Locomotive Steel Tire, ℔ net ton, $13; Buggy Springs, ℔ net ton, $14.50; Malleable Scrap, $5.

EVERETT & POST, 156 Lake street, Chicago, report to us as follows, under date of September 1, 1884: *Pig Lead*—The week just closing has been one of quietness, with prices nominally $3.37½ and $3.40, and we hear reports of some brands having been offered at $3.35, but cannot trace same to any reliable source. The attempt made in New York to sell a block of Lead at $3 50 met with but little success, and the transactions for week there will not sum up over 500 tons at $3.55, and 100 reported at $3.52½. There is a very noticeable improvement in inquiry for Lead to-day, showing that consumers are beginning to look around for future supplies. The quantity of Lead offering continues small, but adequate for present current requirements. We advise our friends to look sharp for any speculative move.

Cincinnati.

SEPTEMBER 1, 1884.—*Pig Iron.*—No increased movement in the market except for No. 2 Hanging Rock Silver Gray Softeners, influenced by the report of the shutting down of some of the most prominent furnaces for an indefinite time; while these Irons are being taken at prices quoted last week, the Southern brands are reported as being freely offered at concessions of 25¢ @ 50¢ ℔ ton and for deliveries through the year. It is thought that demand and supply will work a speedy solution of the Iron industry, and that there is no outlook on lower prices. Quotations for the past week:

HOT-BLAST CHARCOAL FOUNDRY.		
Hanging Rock, No. 1	$21.00; No. 2,	$20.00
Alabama and Tennessee, No. 1		19.50
" " " No. 2	18.00 @	18.50
Lake Superior, No. 1	23.00; No. 2,	22.00
Charcoal Cylinder	21.50 @	....
COKE FOUNDRY.		
Hanging Rock, No. 1	18.50 @	19.00
Alabama, Virginia and Tennessee, No. 1	17.50; No. 2,	16.50
Pennsylvania and Eastern Ohio, No. 1	19.50; No. 2,	19.00
STONECOAL FOUNDRY.		
Hanging Rock American Scotch, No. 1	18.25; No. 2,	17.25
Hanging Rock Silver-Gray Softeners, No. 1	18.25; No. 2,	17.25
Others	15.50 @	17.50
CAR-WHEEL.		
Hanging Rock Cold-blast Charcoal,	27.00 @	29.00
" Warm " "	22.00 @	25.00
Alabama and Tennessee	24.00 @	26.50
Lake Superior	23.00 @	24.00
FORGE.		
Alabama and Tennessee Coke		15.50
Hanging Rock Coke		16.00

Reports come from prominent manufacturers in the West and Northwest of improved prospects for trade and of preparations being made to resume activity in the foundries and machine shops.

St. Louis.

HOFFER & Co., Pig Iron and Iron Ore merchants, 318 Olive street, report to us as follows, under date of September 1, 1884: But little Iron is selling. We quote, nominally, as follows:

HOT BLAST CHARCOAL IRONS.	
Missouri	$17.50 @ 18.00
Southern	19.50 @ 20.00
Ohio	22.00 @ 24.00
COAL AND COKE IRONS.	
Missouri	17.50 @ 18.00
Southern	17.00 @ 18.00
Ohio	20.00 @ 23.00
MILL IRONS.	
Red-short	17.00 @ 17.50
Neutral	16.00 @ 17.00
CAR WHEEL AND MALLEABLE IRONS.	
Missouri	19.00 @ 20.00
Southern	25.00 @ 28.00
Ohio	28.00 @ 32.00

Louisville

GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of September 1, 1884: The market for Pig Iron shows a decided change. Hot-Blast Irons are very much more in demand, and furnaces are this week refusing prices that they were offering to sell for two weeks ago without takers. We revise quotations, which represent cash prices for round lots, as below:

PIG IRON.	
Southern Coke, No. 1, Foundry	$17.50 @ $18.00
" No. 2, "	16.00 @ 16.50
Hanging Rock Coke, No. 1, Foundry	18.00 @ 18.50
Hanging Rock Charcoal, No. 1, Foundry	22.00 @ 23.00
Southern Charcoal, No. 1, Foundry	18.00 @ 19.00
Silver Gray, different grades	15.50 @ 17.00
Southern Coke, No. 1 Mill, Neutral	15.00 @ 15.50
" No. 2 " "	14.00 @ 14.50
" No. 1 " Cold-sh't	14.50 @ 15.00
Southern Charcoal, No. 1 Mill	16.50 @ 18.00
White and Mottled, different grades	13.00 @ 14.00
Southern Car-Wheel, standard brands	25.00 @ 26.00
Southern Car-Wheel, other brands	22.00 @ 24.00
Hanging Rock, Cold-blast	26.00 @ 27.00
" Warm-blast	21.00 @ 24.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 115 to 121 West Main street, Louisville, under date of September 1, 1884, report as follows: There is reasonable activity in business circles, which Iron and its various branches share to a moderate extent. While there is nothing special to encourage manufacturers, odd stocks are being cleared out and trade is undoubtedly getting itself in healthier condition. That bottom has been fairly reached is evinced in the fact of cessation of complaints about lower prices "from other parties," and the seller has the satisfaction of feeling that his sales on the present market will stock without remonstrance. Predictions of better prices have not been realized, for, as much as production has been curtailed, consumption seems also making a race in the same direction. Heavy Sheet is firm. Few concessions are to be had from the manufacturers. Light Sheet is still weakish, and there seems to be no beginning to the ordinary fall consumption. Nails are in good jobbing demand. Buyers are not taking hold of Steel Nails with the rigidity that was promised. The manufacturers are using every exertion to push them upon the market and we hope before long to see the difference in price between these and Iron Nails extinguished altogether. Barb Wire is in good demand, but prices are low. The exposition is attracting a large number of people to the city and contributing in no small degree to local business.

Imports and Exports.

IMPORTS.

The following were the Imports of Hardware Iron, Steel and Metals into the Port of New York for the week ending September 2, 1884:

Hardware.

Boker Hermann & Co. Hdw., cutlery and guns, pkgs., 130
Bamberger & Oppenheimer, Iron wire, cs., 15
Bartlett L. A. Gun barrels, cs., 2
Bustlein, Sury & Co. Machines, cs., 6
Clark G. A. & Bro. Machy, cs., 14
Drexel, Morgan & Co. Arms, cs., 56
Folsom H. & D. Arms, cs., 9
Field Alfred & Co. Mdse., cs., 35; Guns, cs., 9; Guns, nails and hardware, cks., 2
Frasse A. & Co. Mdse., cs., 3
Goddard J. W. & Son, Cases, 20
Graef Cutlery Co. Cutlery, cs., 6
Grinnell, Minturn & Co. Old mach'y, hhds., 3
Hartley & Graham, Arms, case, 1
Hepworth S. S. & Co. Mach'y, crate, 1
Kastor A. Arms, cs., 4
Little Chas. E. Mach'y, bxs., 2
Llado F. & Co. Mach'y, case, 1
MacKinless J. A. Pkgs., 15
Merch. Disp. Co. Arms, cs., 5
Moore's Sons J. P., Arms, cs., 12
Moritz & Reidel, Arms, cs., 69
Moss F. W. Files, &c., cks., 3
Pioneer Iron Works, Machine, 1
Reyn J. Gun barrels, cs., 4; Arms, cs., 49; Cases, 12
Schoverling, Daly & Gales. Mdse., cs., 5
Scott W. P. Arms, cs., 13
Taylor T. Cases, 6
Thompson John, Cases, 2
Tryon E. K. Arms, cs., 4
Western Dispatch Co. Cases, 15
Whyborn E. Chains, 20
Wiebusch, Hilger & Co. Chains, cks., 26
Windmuller & Roelker, Arms, cs., 6
Witte John G. & Bro. Cutlery, cs., 7
Wolff H. & Co. Cases, 2
Order. Barb wire twisting mach'y, cs., 50; Axle, 1; Cutlery, case, 1

Iron.

Baltzer & Lichtenstein, Flat rods, bdls., 5595; Iron rods, bdls., 468; Wire rods, bdls., 84
Baring Bros. & Co. Wire rods, coils, 2724; Wire rods, pkgs., 3740
Brockner & Evans, Wire nett'g, rolls, 85
Cortis R. J. Wire coils, 41
Crocker Bros. Spiegel, tons, 106
Downing R. F. & Co. Pig, tons, 100
Iron Works Co. Cast iron, pkgs., 4
Lilienberg N. Bars, 1498
Lundberg Gust. Bars, 20,992; Bundles, 20
Naylor & Co. Spiegeleisen, tons, 470; Rods, bdls., 397
Pierson & Co. Sheets, bdls., 238
Roebling's Sons, J. A. Coiled rod, bdls., 257
Stetson Geo. W. & Co. Pig, tons, 100
The Electric Supply Co. Tel. wire, coils, 175
Ward Geo., Tel. cable drums, 17
Order. Spiegel, tons, 200; Wire rods, bdls, 377; Wire rods, pkgs, 606; Wire rods, coils, 500; Pig, tons, 600; Tubes, 36; Coils, 5236; Wheels, 26; Cotton ties, bdls., 3300; Coiled rods, bdls., 46

Steel.

Baring Bros. & Co. Wire rods, c'ls, 14,577
Brown William, Cases, 6; Boxes, 5; Bundles, 140
Cary & Moen, Bundles, 535
Dolge A. Wire, ck., 1
Lazard Freres, Wire rods, pkgs., 389
Meckerts O. Cast blooms, 10
Moss F. W. Bundles, 88; Bars, 50
Naylor & Co. Pieces, 316; Wire rods, bdls., 7618; Hoops, 850
Wagner W. F. Bars, 67; Cases, 52
Order. Blooms, 185; Forgings, 84; Bands, 201; Steel ware, cs., 11; Sheets, bdls., 2; Old leaf, tons, 101½; Tires, 2; Straps, cks., 22; Pkgs., 10; Cases, 13; Rails, 4441; Fish plates, bdls., 550; Plates, cks., 3

Metals.

Ansonia Clock Co. Mdse., cs., 5
Baring Bros. & Co. Tin plts., bxs., 875
Cadenas & Co. Old metal, cks., 3
Crooks R. & Co. Tin plates, bxs., 1394
Cort N. L. & Co. Tin plates, bxs., 275
De Witt H. R. & Co. Tin plates, bxs., 938
Dickerson, Van Duzen & Co. Tin plates, bxs., 2970
Drexel, Morgan & Co. Tin plates, bxs., 5973
Elwell Jas. W. & Co. Old yellow metal, bdl., 1
Foote Emerson, Mdse., cs., 5
Gt. West'n Disp. Co. Tin plates, bxs, 1000
Ketchum E. & Co. Tin plates, bxs., 418
Lillienberg N. Martin's metal, coils, 28
Murphy & Co. Zinc, pkgs., 37
Naylor & Co. Tin plates, bxs., 4232; Tin sheets, cs., 47
Phelps, Dodge & Co. Tin pl'ts, bxs., 15,616; Antimony, cks., 40
Swift J. Antimony, cks., 10
Order. Tin pl'ts, bxs., 21,280; Antimony, cks., 117; Tin, slabs, 663

The importations of Cutlery, Hardware and Metals for the week ending August 29 were as follows:

	Quantity.	Value.
Antimony	51	2,876
Brass goods	60	3,507
Bronzes	48	5,803
Chains and anchors	23	1,287
Clocks	107	12,910
Copper	....	28
Cutlery	118	33,871
Gas fixtures	9	1,515
Guns	234	33,595
Hardware	9	650
Iron, pig, tons	3,022	70,027
Iron, sheet, tons	37	2,652
Iron ore, tons	315	700
Iron cotton ties	2,200	1,667
Iron, other, tons	1,718	96,384
Lead, pigs	1,780	5,479
Machinery	71	3,794
Metal goods	241	21,367
Nails	4	501
Needles	9	4,915
Old metal	....	107
Platina	1	2,953
Platedware	7	500
Plumbago	1,175	14,786
Pins	16	386
Quicksilver	250	6,327
Saddlery	6	1,200
Steel	13,923	35,615
Spelter	55,115	1,904
Tin, boxes	51,774	242,030
Tin, 3231 slabs	347,712	69,955
Wire	55	3,971
Zinc	110,280	3,880
Zinc oxide	80	633

The comparison with previous dates is as follows:

	For the week.	35 weeks of 1884.	Same time 1883.
Cutlery, pkgs	118	3,517	5,470
Hardware, pkgs	9	522	827
Iron, R. R., bars	....	9,422	10,642
Lead, pigs	1,780	27,041	6,224
Steel, pkgs	13,923	1,260,173	2,281,608
Tin, bxs	54,754	1,329,728	1,361,010
Tin slabs, lbs	347,712	13,564,899	15,063,873

EXPORTS.

The following were the Exports of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending September 2, 1884:

	Quan.	Val.
Danish West Indies.		
Ptlm., gals	1388	$169
Nails, cases	8	178
Mach'y. pkgs.	2	73
Sew. ma., cs.	7	188
Dutch East Indies.		
Ptlm., gals.	310,000	30,000
Bremen.		
Mf. iron, pkgs.	111	815
Ag. imp., pkgs	4	856
Iron rollers, cs.	4	750
Hdw., pkgs.	22	505
Pistols, case.	1	110
Pumps, pkgs.	6	170
Hamburg.		
Copper, cks.	22	3,925
Copper, bars.	1528	11,010
Ag. imp., pkgs	7	498
Knit machs, cs.	4	900
Mach'y, pkgs.	4	709
Pumps, pkgs.	8	459
Wringers, cs.	2	34
Revolvers, cs.	8	1422
Mf. iron, pkgs	53	380
Sew ma., cs.	1108	26,669
Hdw., pkgs.	54	1,292
Clocks, bxs.	68	1,521
Ptlm., gals.	681,518	56,000
Valves, cs.	10	1,542
Ptg presses, pks	4	500
Saws, case.	1	22
Amsterdam		
Ag. imp., pkge	1	50
Mach'y, pkgs.	4	224
Hdw., cs.	12	188
Stralsund.		
Ptlm., gals.	186,248	10,700
Riga.		
Ptlm., gals.	84,841	7,000
Stettin.		
Ptlm., gals.	327,300	25,988
Liverpool.		
Nails, pkgs.	14	715
Iron rolls, bxs	50	1,300
Hdw., pkgs.	234	5,726
Ag. imp., pkgs	15	278
Iron forges, cs	2	3,765
Sew. mach., cs.	92	2,654
Revolvers, case	1	565
Oxide zinc, bbls	50	300
Saws, cs.	54	158
Copper, pigs.	592	8,700
Copper material	43,604	214,650
Clocks, pkgs.	1096	21,822
Mach'y, pkgs.	92	8,765
Guns, cs.	9	1,795
Wat. meter, cse	1	50
Old brass, bbls	8	510
Pumps, pkgs.	5	274
Copper, cks.	42	7,930
Wire, bbls.	2	200
Antwerp.		
Rivets, case.	1	60
Mf. iron, pkgs	18	150
Ptlm., gals	525,191	41,000
Mach'y, pkgs.	4	1,152
Ag. imp., pkgs	5	101
Sew machs, cs.	31	600
Rotterdam.		
Pumps, pkgs.	6	80
Tin ashes, bbls	3	123
Copper, cks.	90	15,745
Ptlm., gals.	285,000	23,000
Bristol.		
Copper mtte., bbls.	40	989
Clocks, cs.	19	401
Cop. material, bgs	2439	9,000
Plymouth.		
Ptlm., gals.	100,999	8,354
Leith.		
Ag. imp., case.	1	27
Cork.		
Ptlm., gals.	59,240	5,332
London.		
S. rollers, case	1	28
Cartridges, cs.	4	75
Guns, cs.	86	25,084
Ag. imp., pkge	1	25
Saws, cs.	5	235
Hdw., cs.	140	5,102
Mach'y, pkgs.	11	765
Sew. ma., cs.	320	7,261
Rifles, case	1	215
Clocks, pkgs.	44	2,122
Nails, case	1	10
Mf. iron, pkgs.	3	168
Ptlm., gals.	45,000	4,050
Newry.		
Ptlm., gals.	162,240	14,320
Glasgow		
Sew. mch., cs.	417	9,840
Mf. iron, pkge	1	19
Hdw., cs.	2	75
Boiler	1	75
Clocks, pkgs.	107	1,625
Needles, case.	1	357
Hull.		
Mach'y, pkgs.	3	780
Ag. imp., pkgs	3	84
Ptlm., gals.	336,600	29,700
Le Sables D'Olonne.		
Ptlm., gals.	25,260	2,250
Rouen.		
Ptlm., gals.	307,150	24,572
Marseilles.		
Ptlm., gals.	968,678	68,485
Bordeaux.		
O. cop., pkgs.	12	935
Windmills, cs.	19	600
Copper, cks.	180	31,500
Dunkirk.		
Ptlm., gals.	520,566	35,869
Malaga.		
Ptlm., gals.	175,830	15,800
French Possessions in Africa.		
Ptlm., gals.	85,020	9,000
British West Indies.		
Nails, kegs.	239	863
Pumps, pkge.	1	118
Ag. imp., pkgs	11	78
Saws, case.	1	17
Anchors	2	22
Iron, bdls.	37	56
Hdw., pkgs.	69	832
Mf. iron, pkgs	78	823
Ptlm, gals.	48,744	4,859
Scales, cs.	6	123
Mach'y, pkgs.	9	1,157
Sew. ma., cs.	19	350

	Quan.	Val.
Copenhagen.		
Clocks, cs.	2	44
Y. metal, cs.	4	263
Cutlery, cs.	3	52
Cartridges, cs.	8	30
New Brunswick.		
Ptlm., gals.	13,280	1,290
Mf. iron, pkgs	10	800
Nova Scotia.		
Mf. iron, pkgs	6	93
Pumps, pkgs.	3	13
Ptlm., gals.	20,331	2,199
Newfoundland.		
Ptlm., gals.	12,806	1,269
Hdw., cs.	22	150
British Guiana		
Ptlm., gals	3000	270
Sew. ma., cse.	1	35
British East Indies.		
Ptlm., gals.	631,000	62,460
Cette.		
Ptlm., gals.	207,806	14,806
Cuba.		
Mach'y. pkgs.	115	8,513
Hdw., cs.	45	641
Mf. iron, pkgs	220	1,765
Ptlm., gals.	3100	621
Pumps, pkgs.	4	112
Steel rails	1204	9,500
Sew ma., cs.	44	575
Scales, cs.	4	49
Copper, bags.	7	252
Clocks, case.	1	25
Ag. imp., pkgs.	23	104
Iron, pkgs.	27	259
Saws, case	1	82
F. plates, bdls	300	300
Iron tanks	10	599
I. tubes, pkgs	3	136
Cutlery, cs.	16	381
Nails, kegs.	450	1,135
Valves, case.	1	39
Cop. coils, cse	1	167
Barcelona.		
Hdw., pkgs.	14	278
Pumps, pkgs.	2	36
Mf. iron, pkgs	37	212
Ptlm., gals.	80	16
Clocks, cs.	6	140
Havre.		
Cop. mt'ls, bgs.	812	5000
Pumps, pkgs.	7	300
Copper, c'sks.	224	39,200
Ptlm., gals.	98,471	7,262
Ag. imp., pkgs	24	1,911
Fiume.		
Ptlm., gals.	492,500	34,475
Trieste.		
Ptlm., gals.	373,860	28,400
Beyrout.		
Ptlm., gals.	163,500	15,533
Salonica.		
Ptlm., gals.	135,000	11,813
Mexico.		
Tacks, cs.	7	119
Scales, cs.	9	84
Cartridges, cs	3	81
Mf. iron, pkgs	5	54
Sew. ma., cs.	13	237
Cutlery, cs.	3	258
Hdw., pkgs.	49	1,451
Nails, kegs.	12	50
Mach'y, pkgs.	2	87
Pumps, pkgs.	3	139
Nails, cs.	2	33
Santo Domingo		
Cart wh'ls & a	50	1,102
Scales, cs.	2	55
Cutlery, cs.	2	44
Sew. ma., cs.	4	49
Hayti.		
Ptlm., gals.	500	53
Cott. gins, cs.	2	107
Nails, cs.	20	48
Uruguay.		
Ptlm., gals.	20,000	1,900
Mach'y, pkge.	1	120
Sew. ma., cs.	46	605
Cartridges, cs.	10	180
Ag. imp., pkgs	252	2,675
Hdw., case.	1	36
United States of Colombia.		
Sew ma., cs.	90	1,737
Mf. iron, pkgs	112	820
Mach'y, pkgs.	64	3,000
Nails, kegs.	5	16
Rifles, cs.	5	116
Iron, pkgs.	17	220
Revolvers, cse	1	47
Ag. imp., pkgs	11	52
Steel plates	178	665
Ptlm., gals.	9181	928
Hdw., pkgs.	45	1,412
Cutlery, cs.	8	359
Iron safes, pks	17	335
Clocks, cs.	7	364
Scales, cs.	10	51
Cartridges, cs.	3	70
Brass g'ds, cs.	2	82
Mf. cop., pkgs	7	114
Guns, cs.	2	108
S. Pierre (Miquelon.)		
Sew ma., case	1	28
Mf. iron, pkgs	46	250
French West Indies.		
Ptlm, gals.	5000	500
Argentine Republic.		
Scales, cs.	2	55
Mf. iron, pkgs	34	277
Ag. imp., pkgs	11	955
Ptlm., gals.	100,000	9,500
Japan.		
Ptlm., gals.	538,750	53,925
Venezuela		
Mach'y, pkgs.	15	831
Nails, bxs.	18	335
Sew. ma., cs.	62	1,369
Mf. iron, pkgs	150	878
Scales, cs.	3	79
Hdw., pkgs.	83	863
Ag. imp., pkgs	6	60
Cutlery, cs.	4	189
Sugar pans	10	44
Pumps, pkgs.	2	95
Ptlm., gals.	14,704	1,472
Saw teeth, cse	1	57
Needles, pkgs	2	45
Porto Rico.		
Hdw., pkgs.	73	679
Nails, kegs.	32	80
Brass g'ds, cs	8	295

Foreign Markets

FRANCE.

PARIS, August 17, 1884.—*Metals.*—The general business situation in France is still very much mixed up between local politics, the cholera in the South and the Chinese difficulty; hence business men only operate with extreme caution. Metals have been dull and barely sustained. We quote toward the close, in francs, ℔ 100 kg.: *Copper*—Chili Bars, 140 @ 145; Ingots and Slabs, 148.75; Best Selected, 151.25, and Pure Corocoro Ore, 150; *Tin*—Banca, 223; Billiton and Australian, 225; Straits, 223.50, and English, 220. *Lead*, 26.50 @ 27.50, and *spelter*, 37.50 @ 38. *Iron.*—In the Iron market there is a complete breakdown in France, and a demoralized state of affairs, except in the Haute-Marne where matters are still getting on satisfactorily. In this market Flooring Iron is selling at 13.50, Merchant at 16, and Sheets No. 2 at 20. At St. Digier the market is heavy and unsettled on account of underselling that is going on. Coke Merchant at the utmost is bringing 16.50 in the Champagne Iron region. Mixed is selling there at 17.50 @ 18. There is some demand for Sheet Iron for Central and Southern France. Wire Nails are dull for the want of export orders. At Valenciennes there is a slight recovery in the demand and the tendency is better, those in want of Iron deeming the moment opportune for a recommencement of operations. *Coal.*—Nothing of special interest has occurred; the demand is moderate, but prices are no lower.—*Moniteur des Intérets Materiels.*

BELGIUM.

BRUSSELS, August 18, 1884.—*Iron.*—During the week under review the Government have come forward with some trifling adjudications of railroad material. The prices tendered on the occasion go to prove that Belgian Iron industry is in a precarious position. The gradual accumulation of stock at the blast furnaces continues, production in the Longwy Basin being evidently excessive. Meanwhile English Pig is obtainable at 5.30 francs ℔ 100 kg., and Luxembourg at the same figure, while Charleroi foundry fetches 6.75; ordinary Puddling ranges between 4 and 5. Merchant Iron remains as heretofore—11.25 for No. 1 for export and 11.50 for home use; No. 2, 12; No. 3, 12.75. Beams are 12 @ 12.50; Corners, 12.50 @ 13; those for vessels, 13.50. There has been a moderate demand for Sheets at 15.50 No. 2; 17.50 No. 3; 21.50 Commercial; 23.50 Thin, and 23.75 No. 4. Works generally are moderately busy; the prices they obtain just about leaves them whole, and they go on struggling in hopes of a favorable change during the fall in view of fine cereal crops, easy money markets and the unruffled aspect of Continental international politics. Prices of Iron are besides so low that consumers have every inducement to anticipate wants during the active season now approaching. *Coal* is moderately active and keeps steady, except the commonest industrial, now down to 6 francs ℔ ton.—*Moniteur Industriel.*

GERMANY.

HAMBURG, August 19, 1884.—*Iron.*—The Iron market has been less firm than the week before, especially as regards Pig Iron. The latter has been comparatively neglected in Upper Selesia since the abatement in the export demand, so that stocks now begin to accumulate. Meanwhile a good many blast furnaces there are undergoing a transformation to turn out chiefly Coke Pig, for which the demand will prospectively be greatest. Common Gray Puddling Pig is selling there at 54 marks. Meanwhile quite a number of works are putting in new machinery, leading to greater activity in foundries and machine shops. Rolling mills have a fair share of work on hand in all branches, Merchant Iron and Sheets moving off steadily; all Bessemer products have been in good request, there being considerable animation in railroad material. This may also be said of steam boiler-makers. In Rhenish Westphalia Pig Iron is also decidedly weak; it is rather too freely and pressingly offered, which is mainly due to English competition. Rolling mills begin to complain of a lack of orders and there is a good deal of competition among them. This leads to occasional underselling and weakness, extending notably to Boiler Sheets. While Iron Wire and Wire goods remain wanted, Steel Wire is not so well sustained. Steel and manufactures are doing well both for home wants and exports. Steel Hoops and Car-wheels are doing tolerably well, and so do Hardware, Machinery and Hollow-ware. *Metals* have been steady; German Lead, 11.75 @ 13.50; Lake Copper, 63 @ 64; Tin, 90 @ 95, and Spelter, 14.85 @ 15.10.—*Borsenhalle.*

HOLLAND.

ROTTERDAM, August 14, 1884.—*Tin.*—The market shows great firmness at 52.50 guilders ℔ 50 kg. Banca, spot; Billiton do., 50.50, and do. non-delivery, 51.25. At Amsterdam there is also great steadiness, Banca being paid 52.25 @ 52.50, and Billiton, spot, 50.50, at which it is wanted. Nothing doing in futures at Amsterdam.—*Koch & Vlierboom.*

AUSTRIA.

VIENNA, August 17, 1884.—*Iron.*—The market in Austria-Hungary is decidedly weak, and this is confirmed by the report of the Vienna Chamber of Commerce, just published; nor has there been the least return to activity in Pig Iron. Finished is, however, a little firmer than the latter, because of the restricted output. The demand for rolling-mill products is slack, including Sheets. Machine shops and Structural Iron concerns complain of a lack of orders. Very little progress is being made in railway construction, but it is thought the Government will soon give some orders for material for its lines, as soon as the terms of payment shall have been settled. At the close Pig Iron is weaker; the demand for Sheets revives somewhat, and great activity is springing up in Iron Wire. We quote in florins, ℔ ton; Pig, 51 @ 58; Merchant, 115 @ 134; Sheets, 170 @ 190, and Beams, 130 @ 135. *Metals* are quiet and unaltered.—*Austrian Trade Journal.*

EAST INDIES.

PENANG, July 12, 1884.—*Tin.*—There has been a good supply during the fortnight, and an active demand to meet it, Chinese at first having to pay a higher price. The market opened at $25.65, then advanced to $25.77½, but finally receded to $25.50, at which figure the closing sales were effected. Receipts amounted to 9500 piculs, Europeans taking 4700 piculs and Chinese 3300. *Exchange* 4 months' sight, London, bank, 3/8¾.—*Schmidt, Kustermann & Co.*

[Per cable to Messrs. Van Lennep & Chevalier, New York.]

BATAVIA, August 29, 1884.—*Tin.*—The Batavia Billiton Tin sale to-day averaged 55.75 guilders ℔ picul, equal to £84. 5/, cost and freight, ℔ ton, to New York, by steamer via Holland.—*Dummler & Co.*

Heating and Hardening of Steel.

To understand how to properly harden and temper steel tools and other articles is fully as necessary to the machinist now, when most small tools are kept in stock by dealers, as it was 20 years ago, when each shop made its own tools, says the Sheffield *Telegraph*. Lathe and planer cutters, cold chisels, milling cutters, and several other tools and appliances are liable to breakage, and must be redressed at the anvil, and refinished, and rehardened and tempered. But many of these tools are ruined in the attempt, and this destruction usually comes in the hardening. Some mechanics attach much importance to a hardening pickle, but probably failure comes as often by injury in heating the article as by hardening and tempering. An evenly-distributed heat of the proper temperature is absolutely requisite to success, and this it is not always possible to assure by heating in an open fire. One portion of the article is liable to be overheated; judging of the amount of heat by color is not always to be trusted; a dark corner or a cloudy day changes the condition from a light shop and a sunny day sufficently to make a great and telling difference in the amount of heat judged by sight. A perfectly reliable method of heating for hardening is by means of a lead bath. It an easy matter to keep in the shop a crucible or iron pot of lead to be used as occasion demands. The article to be heated for hardening will not suffer when in the lead bath, even if not closely watched, as is necessary at the open fire; the melted lead cannot pass to a degree of heat injurious to the steel. But one condition must be strictly observed—the lead must be pure and clean; it is best to buy the mercantile pig for this purpose. A manufacturer of pipe-threading and pipe-cutting tools, desiring to abandon his old-time open-fire method for the lead bath, melted a lot of old lead pipe partially corroded, and mixed with it a quantity of type metal. His hardening was a failure until he used pure lead. In order to harden well it is necessary to heat the article through and through. If the piece is of unusual thickness, as a tap or reamer of 3 inches or more in diameter, it is better to drill a hole through it from end to end, so that the heating can be even and the hardening be equal. A tap of 4 inches diameter broke squarely across in the hardening. It was of solid steel. The drilling of an inch hole from end to end was practiced, and a large number of the same size taps were hardened without a failure. The surfaces of the fracture of the broken tap showed plainly the evidence of unequal heating and uneven cooling.

A Perilous Piece of Work.

At 8 o'clock last night, says a recent issue of the Washington *Republican*, the elevator in the Washington Monument carried down from its 300-feet top to mother earth 21 persons. Eighteen of these were workers and three visitors. Fourteen of the workers had been at the top for 16 hours, the last two of which they had labored in the rays of electric light. This was thrown from the Smithsonian tower and the Treasury by two of the reflecting lights of the Brush-Swan Company. The needs for this long turn of work lay in the necessity of securing the eight immense beams upon which the derrick to be used to place the roof stones in position is to be erected. These are 60 feet long and about a foot square. They stand within the 30 feet of diameter to which the top of the shaft has narrowed, uniting at the top. A mast, 26 feet long, will pass through the center, projecting some 15 feet above them again. On this will be a horizontal bar 20 feet in length, which will form the derrick and be easily movable upon a center, turning on an ingenious adaptation of the ball bearing in use on bicycles, and formed of a number of grapeshot from the arsenal, which are placed between two grooved plates. So readily does this respond to the application of force that even with a superabundant weight of 20 tons a child can turn it.

The gale that came up about 2:30 o'clock yesterday afternoon caught the work in a highly dangerous condition, none of the beams being then secured, and scarcely any warning preceded the blow. Superintendent McLaughlin managed to prevent the panic which threatened his force of men, many of whom had hats and coats blown away, and all hands were soon hard at work executing what temporary measures could be inaugurated on the spur of the moment. They had scarcely succeeded in combating the furious force of the wind when a violent hailstorm came on, corresponding with the heavy rain which fell in the city. The velocity of the wind as registered at the Signal Office was 28 miles an hour, but previous extended experiments with an anenometer on the top of the monument demonstrated that the rate shown on the ground was always doubled on the monument top. These experiments were made two years since, when the shaft was not much more than half as high as it now is, so that the estimated velocity of the hurricane was probably not less than 60 miles an hour. The men were sustained while at their perilous work by meals sent up to them at regular hours.

From another source we take the following description of the manner in which the completed monument was recently inspected: "All day long a workman in a sling moved slowly up and down the 500 feet of marble, inspecting every block and joint to note any irregularity of substance or of masonry. Perhaps he was also looking for some possible result of the recent earthquake. The man in the sling swung slowly up and down against the smooth marble shaft, looking very much like a fly in the distance; now pausing by signal to more closely inspect some particular point, now rising again toward the clouds, looking all the time as cool as if he were swinging in a hammock under the trees. The work was found in excellent condition. Now that the frame timbers placed on top of the monument reach a point somewhat higher than its final summit is to be, the workmen whose duties call them to or near its top reach a higher elevation than has ever been attained on any structure reared by human hands. So far as can now be judged, from the foundation line the highest point is about 570 feet."

The altogether unparalleled feat of building 100 freight cars in nine hours was performed in the freight-car shops of the Pullman Palace Car Company, at Pullman, on August 18. The cars were flats, and formed part of an order for the Vicksburg, Shreveport and Pacific Railway Company, who desired to have them delivered as soon as possible. The task was accomplished without any special extra preparation. The work was "laid out," as usual, on Saturday—that is, five sets of wheels and axles were placed on each of the seven tracks used in the work, and the materials for each of the cars were placed along the tracks in the usual manner. When the whistle sounded at 7 a. m. the men went to work. Of the 29 gangs, 28 consisted of four men each, but the best gang was one hand short, because of sickness. The three men preferred to do the work themselves rather than take on a fourth hand. The first completed car was turned out at 9.15 a. m., and the first lot of 12 completed cars was pulled out of the shop at 10 40 a. m. The hearty interest felt by all the men in the contest was shown by the cheers which rang along the lines when this first finished lot began to move out of the shop. At 4 p. m. the floors were being laid on the last two or three of the 100 cars. It is within bounds to say that the whole number was finished by 5 p. m., and by 6 p. m. 24 of them were lettered and ready to ship. The remaining 76 were lettered and shipped during the next day.—*Railway Age.*

According to an Associated Press telegram from Cleveland, Ohio, the Cleveland Non-Explosive Lamp Company made an assignment on Monday to William Walton. The company have been unable to meet their paper for some time, and a number of suits recently begun by Detroit and Chicago firms, for materials furnished, brought matters to a crisis and forced the suspension. The company employed about 200 men. The assignee's bond was fixed at $60,000. The liabilities are about $50,000, and the assets, consisting of machinery, &c., about half that amount.

Trade Report.

General Hardware.

We hear in some quarters of an improvement in the demand during the past four days, but this is by no means general, and the usual report is of dullness. Changes in prices have been few and the week has been devoid of any feature of excitement.

The Plane Makers' Association have reduced the circular price of Planes and Plane Irons 10 per cent., to take effect on the 1st inst., making present quotations as follows, subject to a discount of 2 per cent. for cash in 10 days:

Fancy Planes	dis. 15&10 %
First quality Bench Planes	" 20&10 %
Second " " "	" 25&10 %
Plane Irons	" 20&10 %

This association consists of the Ohio, Sandusky and Auburn Tool companies. John H. Graham & Co. are agents for the association and supply any of these makes of goods at manufacturers' prices.

Irregularities in the selling prices of Butts have led to the withdrawal from the Butt Manufacturers' Association of the Reading Hardware Company, who now quote:

Fast Joint	dis 60&10 %
Loose Pin and Loose Joint	dis. 70&10 %

NAILS.

The trade of the past week has varied but slightly from that of the week preceding, in some quarters a little more activity being reported, but in others less. The first few days of September have opened up rather fairly, however, and a good month's business is looked for. Prices are becoming more unsatisfactory to manufacturers, and we hear of a decided movement to close up a number of factories in the East if there is not an improvement in this direction soon. Should these establishments suspend operations they will probably continue idle until times take a turn for the better. The trouble is not with New York store prices for the ordinary lots now moving, but with prices realized on dock for large quantities, which have been seriously demoralized by the efforts of some manufacturers to force their Nails into this market. Stocks generally are not large in the warehouses here, and we are cognizant of refusals by some parties to sell 1000 keg lots at the price necessary to compete with the terms offered by Central Pennsylvania manufacturers, as the former claim to be able to dispose of their current production without making sacrifices. Inquiries now being made indicate a growing speculative interest, which will be developed very shortly if the downward tendency of prices continues much longer. Sales during the week have been made on a basis of $2.30 @ $2.35 for small lots, and $2.25 for large lots, with the market in buyers' favor for quantity.

BARB WIRE.

Local establishments report an increase in orders, accompanied by the gratifying fact that orders are also larger than they have recently been. The export trade continues of about the same proportions as it has been for several weeks. Factories having Southern connections experience an increased business, and reports from the West are to the effect that the trade of that section is picking up considerably. As fence building will be prosecuted vigorously in October, orders for Barb Wire are expected to be more abundant from jobbers very shortly, in anticipation of the demand from consumers. Great expectations are entertained of the fall trade, which some manufacturers predict will be larger than ever known. Prices thus far show no improvement. Quotations continue as follows: Small lots of Painted Four-Point, 5 cents per pound; Galvanized, 6 cents. Carload lots of Painted, 4½ cents; Galvanized, 5½ cents. These prices have been shaded for desirable orders.

A new and revised edition has just been issued of

LAMBERSON'S HARDWARE PRICE BOOK,

which is in many respects an improvement on its predecessors. The most important change is the omission of all list prices. This was done on account of the frequency with which they change and the impossibility of erasing printed figures. Indeed, the publisher strongly discourages the use of ink, recommending instead a moderately hard pencil, which will not rub nor transfer, but can still be erased. The alphabetical arrangement has been made more complete, and the headlines are printed like the catch-words in a dictionary, making reference easy and rapid. The size is reduced to 250 pages, 4 x 7 inches, making it a very convenient book for the pocket. Price, $4 each. See advertisement on page 26.

CATALOGUES.

The new catalogue of the John Russell Cutlery Company is particularly complete and satisfactory in all the features which should be looked for in such a work. It consists of 144 handsomely lithographed pages, 11 x 14 inches, giving illustrations, descriptions, numbers, &c., of their goods. Twenty four pages are devoted to Case Combinations, the illustrations of which are colored to imitate the materials of the cases, producing a surprisingly good effect. We quote from the introductory circular: "Great care has been taken to have the illustrations perfect in outline and detail, and the numbers and descriptions clear, concise and intelligible. Excepting Carvers, Slicers, Steels, Bread and Mixing Knives, Case Combinations and a few large pieces, all goods are represented full size. Where reduced sizes are shown the proper proportions have been carefully preserved."

The new catalogue and price list of the Tucker & Dorsey Manufacturing Company shows in an attractive and convenient form the line of goods made by them, including Alarm Tills, Saw Bucks, Wood Saw Frames, Slaw Cutters and other Wood Goods, Stove Trucks, Martin's Patent Casters, and Table Legs mounted on No. 7 Casters. These Legs are handsomely turned out of hard maple, and are intended for the use of those requiring Tables for Canning, Bottling, Samples or other purposes demanding strength and portability. With these Legs they can be built cheaply and easily. The list price it $2.50 per set of four.

BUSNESS ITEMS.

In their advertisement on page 24 John P. Lovell & Sons, Boston, show a cut of the Lovell Roller Skate, for which they are the sole agents for the United States, and for which they claim the easiest action and nearest approach to the motion of ice skating yet produced in a Roller Skate. Besides referring to what is said in the advertisement we quote as follows from their circular: "The tension springs we use always brings the trucks back in a central line to the Skate, which is a great advantage over the rubber cushion commonly used, the great objection to rubber being that after using a short time the trucks become set to the right or left, and require renewing constantly. Patrons of rinks will appreciate this very important advantage. The saving to rink managers in repairs has been the greatest recommendation of this Skate."

The Union Stone Company, of Boston, Mass., as will be seen by their advertisement on page 41, manufacture a wide variety of Emery-Wheel Machinery. Besides Emery, they deal in Quartz, Corundum, Pumice Stone and Glue for Polishing-Wheels, also supplying Special Tools, Dressers and other articles connected with the use of Emery.

We invite the attention of our readers to the advertisement of M. Bare, manufacturer of Hoes, Garden Tools and Steel Rakes, which will be found on page 24, and which shows some styles which have not appeared in previous issues.

CUTTING OF PRICES.

The letters which we published last week on the cutting of prices appear to have attracted general attention in the trade, as we have received numerous communications on the subject from manufacturers, jobbers and importers in all parts of the country, some of which we lay before our readers today. The first is from one of the best-known manufacturers of tinware in the East, who makes the manufacturer at least equally responsible with the jobber for the demoralization of prices, and gives some eminently sensible suggestions on other points:

We have been much interested in the articles printed in *The Iron Age* on the subject of "cutting." In our opinion this iniquitous practice is not to be laid wholly at the door of the jobber. True, he has had things his own way of late; packages, cartage and freight on many classes of goods have been given him in lavish abundance, and he has not duly appreciated the benefit. Like all human kind, he is generous enough to ask for more, and the manufacturer has only himself to blame for yielding to such demands. It is safe to say that many manufacturers give away their entire profit, and possibly suffer loss, by throwing in, free of cost to the buyer, all these items, which are a tremendous expense and a legitimate basis of charge. The evils are great, and "what to do about it" is the all-absorbing question. Can we cure the malady by attributing its cause to some one else? We think not. The jobber may be to blame, but others are even more at fault than he. In fact, the temptation with the manufacturers to reduce prices is stronger than with the jobbers. In times of stagnation in trade the jobber may refuse to buy; he may trim his sails and lie close to the shore, waiting for his opportunity, while the manufacturer must stay in deep water. He has not only his capital invested, but, in addition, he has men in his employ whose many families are dependent on him for sustenance. Perhaps he is in a small town and his factory is the chief concern therein. To stop his works would be to lose his men, who are skilled to serve his purposes. When trade revives he cannot bring them back easily, and so, "to keep things running," he will offer goods at a brokerage of profit, or even at cost. These cases are common, and certainly not attributable to the jobbers.

But how shall we get out of this "slough of despond?" Human wisdom is weak and hardly able to cope with the difficulty. Combinations are an abomination, as all experience shows. When once you have sold your goods, unless they be specially protected by a strong patent, and successful litigation besides, you cannot hold the jobber to a price. The goods are then his to sell for what he pleases. The only way seems to be for dealers and manufacturers alike to "tone up" in honesty of purpose and integrity in all commercial transactions. For example, in any failure in business, let no preferences of any kind be countenanced, but let all "share and share alike." Let each manufacturer make honest goods, whether of low or high grades; let them be uniform and sold, at least during these troubulous times, for a small profit, and, as far as practicable, f.o.b. at his place of business. Let him give no purchaser the opportunity of "doctoring" invoices by deductions for extra freights, &c. If the circumstances are peculiar and demand some adjustment of freight in order to compete with an other dealer, let him make a certain and absolute allowance for freight on the invoice, thus ending his responsibility when goods are shipped. This will prevent the purchaser from taking packages from depot and paying any rate of freight, irrespective of bill of lading, which the agent may impose, and then deducting the entire amount from his remittance and leaving the seller to suffer the imposition or make his own attempt upon the transportation company to get the excess refunded. Let salesmen keep well in mind the distinction between "paying" or "allowing freight" and "delivery" of goods. One may agree to make a contribution toward paying a part or all of the freight on a given shipment, but this does not affect the ordinary rules of trade or the law as between seller and buyer. In so doing the seller assumes no risks of transportation, while if "delivery" be guaranteed the purchaser can demand freight, insurance, and possibly drayage in his own town, besides claiming that invoice shall date from time of arrival, and not from time of shipment. These are a few of the points which suggest themselves to us, but we are aware they cover but a tithe of the subject.

A New York manufacturer of Hardware specialties lays the blame on quantity prices, as follows: "It is a very serious matter in trade and a hard thing to regulate. We think that the fault is partially with the manufacturers in making quantity prices. All jobbers should have the same price. This puts all on an equal footing, and gives the smaller jobber an equal show with the larger. Each would make their profit, and in the end nearly or quite as many goods would be sold. If the manufacturer goes to a jobber and gives him an extra 5 or 10 per cent. for an order of 50 dozen instead of 25 dozen, he must not complain if the jobber tries to unload by giving away the extra discount, as he then would make as much as his neighbor who did not take the quantity."

A Western Saw manufacturer considers it a difficult problem: "The question has always been to us a difficult problem, viz., a continuous ownership after the goods have passed into the hands of the dealer. If others can manage it, we do not object, but with our views we would not hazard such a plan in the present depressed condition of trade."

The following, from a large Southern Agricultural Works, is very clear and practical:

Our experience has not been quite so bad as that of others; still we have suffered some and have been considerably annoyed by same case. In our opinion there is but one practical remedy—*i. e.*, the manufacturer to sell to the jobber at best discount he can afford to give, fixing at the same time prices, &c., for the small and medium trader which shall leave the jobber a reasonable and fair profit; then let it be distinctly understood that the jobbers and manufacturers will sell to the trade at said prices (or above, but not less), or that any cut made by the jobber will be met by the manufacturer, putting the price to the general trade even lower than cost price to the jobber. Some jobbers may be willing to sell at a loss; such would not be desirable customers to the manufacturers at any time; the majority of them, when they find that the cutting of prices will not secure them the trade, will soon come back to reason and uphold prices, giving manufacturers more assistance even than before making the cut, having learned from experience the demoralizing and evil effect it has upon the trader. We believe that if this course was strictly adhered to and carried out for some time the matter would soon regulate itself to the entire satisfaction of all, so that the cutting of prices would be a rarity rather than a usual occurrence, and their business would run more smoothly and not be so often disturbed and clogged.

Another Southern Agricultural Implement maker writes: "Our experience is that the cutting of prices and selling goods at cost by the manufacturers is due to the jobbers selling goods at cost. We know no remedy for the evil except for the manufacturers to have only one price for their goods."

An Eastern manufacturer of Agricultural Implements says: "We have suffered severely at times, and in some cases would not allow jobbers in certain localities to handle our goods on account of their giving away of nearly all the discounts we gave them, and in giving them to customers we were selling at list prices."

From a well-known Western Agricultural Implement firm we have the following: "All manufacturers are injuriously affected by the practice of some jobbers and salesmen, who give away commissions, and hope to, and in some cases do, make up on other goods the loss, thus seesawing until buyers are not at this time governed by prices or discounts. This is causing manufacturers who make large enough lines to put on their own men as salesmen and agents. Some agents, jobbers, &c., are fair and straightforward in this matter, but, sad to say, seem to be handicapped by the others, who do business as intimated."

One large Western Tinware manufacturer asserts that the jobber "wants it all," and that in consequence they do as little as possible through the jobber, while another house say they would rather do a smaller trade and sell to the retailer direct.

A Western jobbing house retaliates sharply on the manufacturer in the following letter. That there is much truth in this statement cannot be denied:

The trouble is that nearly all the manufacturers throughout the East, and West, too, so far as that is concerned, call on the jobber throughout the West and load them up with goods at the best prices they possibly can get; then the next manufacturer of the same line of goods will come along; he finds that the jobbers have purchased of some other manufacturer; he immediately slides out into the country to the small dealers and quotes the same goods at perhaps lower prices than paid by the largest jobbers. This is being continually done, and is the common practice of the manufacturers, so far as we are able to judge. We, as jobbers in the West, find our greatest competition comes from the factories. We find this with nearly every line we are handling, and it seems to us only a matter of a little time when the middleman and jobber will have to seek other employment. The small dealer at some obscure cross-roads is about as well posted on factory prices and cost of goods as the best jobber in the largest city. The trouble with the manufacturers, as a rule, is that they wish to sell the large jobbers, then they wish to go to the jobber's customers and sell them also at a little lower price than they sold the jobber. Of course this does not apply to all manufacturers. What difference does it make to the manufacturer at what price the jobber sells his goods, so long as he buys his goods in good faith and pays cash for them? Let the manufacturers confine their trade to the legitimate channel—that is, sell the large jobbing trade—then they would have no cause for complaining at prices jobbers sell their goods, simply because they would not go through the country seeking the jobbers' trade and thereby find out the prices at which the jobbers are selling.

The following letter from large manufacturers of Hardware Specialties will be read with interest. They seem to think the discussion will be beneficial to the trade and may lead to practical measures of relief:

Referring to your articles on "cutting prices," we are glad you have introduced the subject for discussion in *The Iron Age*. We are not prepared to present a remedy for this acknowledged evil, but we will at least express our sympathy for your course in drawing out and publishing the opinions of leading business men. This must result in some benefit. It must do some good to force the fact that this cutting of prices helps no one in the long run—not even the consumer—because cutting of prices leads directly to the cutting of quality. This is a big subject and many-sided, so that it is difficult to place censure at the right door on the one hand, or suggest remedies on the other. It will hardly do to lay all the fault to the jobbers. Manufacturers, as well, are responsible. We have heard of cases where salesmen of manufacturers have offered cutting prices where they did not expect an order, just to make a competitor settle at a lower rate, formulating the operation by saying "They may sell the goods and we will make the prices." This is probably an extreme case, but it illustrates the reckless work that is sometimes done under the spur of sharp competition. The manufacturer reaches the consumer through the jobber and the retailer. The jobber buys in large quantities and distributes the goods on a large scale. The retailers' operations are more contracted as to both territory and sales, and, of course, so are their purchases. They both carry stock, and it is for their interest to secure a permanent trade and have prices steady. They invest their money and they should have a reasonable profit. The manufacturer can sell large lots cheaper than small, as has been said. Here comes in a third class of distributors or purchasing agents, who operate on the ground covered by the large jobbers. They do not carry stock; they do not own or rent expensive stores. These men are well acquainted with the trade and prices. They secure, if possible, the best quotations from the leading manufacturers and give the customers of these large jobbers better rates than they have been having. The jobber finds his trade slipping away from him, and in self-defense has to "meet prices." Here is the way, in our opinion, much of the cutting originates, and we cannot well blame the jobber for trying to hold the line of trade and customers that he has worked up. We say much of the cutting—we could not say all. Overproduction and the efforts of both manufacturers and jobbers to extend their business and trade are, after all, probably the largest factors in the problem.

We have a characteristic letter from a shrewd and well known importer of New York: "Cutting prices! There is being a lot of ink unnecessarily wasted. Nothing substantial will ever be accomplished until both manufacturers and jobbers lay in a good, lasting stock of common business sense. There is no country in the world where people make such consummate fools of themselves in the matter of competition as in the United States. The only remedy is common sense, and, if business men refuse to cultivate this healthy and useful remedy, their troubles will go on increasing until a measure of common sense is knocked into them, and it will probably take some very hard knocks to accomplish this."

In the following letter from a manufacturer, a system of doing business by the jobber is exposed that is positively dishonest and deserves condemnation:

We are practically out of the field, as we do not supply the jobbers. There are two reasons why we do not try to sell them our manufactures. The first is that we are making ware of the first quality, from the best materials, in full standard sizes and in a workmanlike manner, and we cannot without loss sell these goods at the extremely low prices made by the makers of low grade goods. The second is that jobbers who have bought small lots of goods of us have represented to their customers that they were handling our goods, and have induced them to place their orders at lower prices than we make. In executing these orders they have sent goods made by other manufacturers, with, perhaps, a little sprinkling of ours. It will be readily seen that this scheme injures us in three ways, viz.: It cuts us off from our customers, who know and want our goods; it breaks down our prices, and it injures our reputation as manufacturers.

The following view of the subject is from an extensive manufacturer of House Furnishing Goods and jobber in the South. The letter is sensible and moderate in tone:

Of course, any policy so suicidal as the giving away your profit has my earnest disapprobation, and such a course leads nowhere but to failure. However, I think every jobber knows that the small percentage of profit he has is barely sufficient to pay his expenses, and his cutting cannot go very deep. There should be no competition between the manufacturer and the jobber. The manufacturer who wants to sell to the jobbing trade should protect it, and not sell at all to the retailer. My experience is that the bulk of the demoralization lies with the manufacturers; they enter into competition with the jobber for the large retail trade, and quote them prices just a shade higher than jobbers' prices, but at which prices all jobbers would finally be ruined if met by them to a universal extent. Fortunately, there is a large class of retail trade that the manufacturers cannot reach, on account of their lack of salesmen to the small towns. But the great evil is that manufacturers will sell to jobbers and then immediately sell to the most desirable retail trade, and thereby demoralize prices. As we are all aware that the retailers almost universally give away their prices, and as no one likes to lose a good customer, as soon as a price is quoted it is met, even if goods are sold at cost, by the jobber. Another cause is that manufacturers will sell large quantities to the large 5-cent trade cheaper than they do to the largest of jobbers, and the 5-cent trade has been a source of continuous demoralization, in bringing down prices on leaders to such a level that no one could make a living. I am entirely cognizant of many goods being bought at $7.20 per gross and retailed at 5 cents per piece, and some goods that the jobber cannot purchase at $7.20 per gross, and the manufacturer can hardly produce at that price, yet, for the sake of selling a thousand gross of one article, he will sell at bare cost of production, demoralize trade and then be the first to squeal when the shoe commences to pinch him. The only remedy is for the manufacturers to sell only to the jobbers, and to no one else; then, if the jobbers cut, it is their funeral, and not the manufacturers'.

A large Eastern Tack manufacturer proposes a remedy that we fear will not stand much chance of adoption. While it would be well, no doubt, to have only men who understand business engage in it, we are never likely to see the time when those who think they understand it will be prevented by advice from making the experiment:

Instead of finding fault with the jobber for cutting manufacturers' prices, I would inquire into the cause and seek for some remedy. Many manufacturers, jobbers and dealers are now, without doubt, selling goods at a loss, and the question is asked, What are we going to do about it? It is safe to assume that each manufacturer, jobber and dealer will do what he thinks will be for his own individual interest under the circumstances in which he is placed. Very often he will do the wrong thing, but he will do what he thinks will be the best. It seems to me the principal cause for inflation and depression in business, and consequent cutting of prices, is that altogether too many engage in the manufacture and distribution of merchandise who have no especial fitness or education for the particular thing they engage in. Often a man who is qualified for a position as bookkeeper or salesman will think he can do better to engage in business for himself; or a father may start his son in business, giving him capital, but no other qualification. These men soon find the capital required is more than they expected; the cost of manufacturing or distribution will be greater for them than for those who have been a long time engaged in the business; they will complain of low prices, and, to meet maturing obligations, reduce them still lower, selling at an actual loss and hoping for something to turn up. There is but one end surely awaiting them, and a bankrupt law will help to repeat the operation.

Now this is certainly wrong; a man to succeed must not only be naturally adapted, but he must thoroughly learn the business he intends to do. A machinist does not try to get a position as molder, neither should a man capable of managing a bank undertake to build and run a blast furnace, or a good salesman think, for this reason, he is qualified to manage a manufacturing establishment or jobbing house. The young man may ask how is he to know whether or not he is fitted to do some particular thing unless he tries. He can certainly find out by trying, but it would be cheaper for him to consult his present employer, or one under whom he served an apprenticeship. If he has had no employer in the business, it will be safer for him to obtain one. When the present condition of trade has existed long enough the remedy will be forced upon us. Those who have sufficient capital and ability will want to know all about the character, natural ability and capital, as well as the special education the person has received, and the necessity for the business in which he is engaged, before giving him credit. It will then be found that it will not be for the interest of any one to have it known or suspected that he is selling goods at a loss. The profits will be small, and if any manufacture or instrument of distribution is not needed the profit will grow small enough to persuade those engaged in it to retire. This cause of our trouble and the remedy will be particularly repulsive to all unfitted for the business in which they are engaged, but it will commend itself to all who are in every way qualified. It is for this latter class to organize and apply the remedy.

A Southern Steam Threshing Engine and Machine company recognize the evil, but fail to point out a remedy:

By your issue of 21st we see the matter of cutting prices by jobbers is receiving proper attention, and deservedly so, too, for it is a great evil creeping into various branches of trade, thoroughly demoralizing in its tendencies in materially adding to the already too rapidly growing uncertainty of trade, making the purchaser more timid and uneasy, and working positive injury and injustice to the manufacturer, while resulting in good to nobody. Tending as we certainly are in all directions to lower prices, it requires but little to cause uneasiness, if not alarm, and to have the actual governing price to good retail trade published regularly through a reliable, well-informed medium like *The Iron Age* would certainly not be

without great benefit in renewed assurance and established confidence.

A New York manufacturer thinks the question a decidedly mixed one, and believes that in agitating it some good may come of it. He says:

I think with the jobber you should include the host of manufacturers' agents, who, I think, are a very important factor in cutting prices, and not so much from an intention to do so as that he fails to take in the situation; does not sufficiently know the goods, their cost, limits, &c., and all this is augmented by an over-desire on the part of travelers to make sales, as well as the lack of honest business principles in many of the buyers, who, if they do not say outright that they can beat a certain price, use tactics that give an impression that they can, and seller is not there to accept it as true, and so the price becomes broken. We need a good deal of the old-fashioned, straight-forwardness on the part of some buyers before this evil will be remedied. We cannot believe that any of this cutting is done just for fun, but there are more sellers than buyers, and it's a matter of demand and supply. If goods could be handled only by men of experience and good common sense, there would be but little trouble; but, as we suggested before, as long as parties of little experience in general business and no practical knowledge of the specialty offered have the handling of the manufacturers' goods, there will be this trouble. This is decidedly a mixed question, and I am not sure that any good will result; still, I believe in agitating such questions and sometimes good comes out of it. Surely it is time for manufacturers to do something in regard to this, as it is an awkward fact that they have but little to say as to what their goods shall bring in market, who are the only ones who should fix values on their products.

The following, from an Eastern Lock manufacturer, is a plain and forcible statement, and will be read with interest:

Your timely words on "cutting" by the jobbers will serve a good purpose. These are days for plain words. Hard pan in business usages is as much in demand as any other element to mend the present situation. In my opinion, the remedy for the evil to which you refer is within reach of the manufacturer, who, unless he can succeed in maintaining the jobbing prices of his wares, must see his capital melted away to meet the prices of rivals, who for some reason sell regardless of cost. The manufacturer must control the price made by the distributing agent, be he a jobber or a drummer, and he must carefully avoid setting up competition in his own products. If, as is usually the fact, he is too small a producer to maintain a depot in every town, or even in the great distributing centers of trade, he can effect an arrangement with some house by which his goods may be represented within certain territorial limits. This arrangement made, the manufacturer should upon no consideration make so low a figure to any other dealer of any grade in said territory. The maximum discounts to retailers should be agreed upon and should in no way be exceeded nor beaten by either party. Under such conditions the jobber who cuts is unworthy of confidence, and should get his "special" no longer.

In this view the jobber becomes less of a speculator upon the misfortunes and capital of manufacturers. Both parties are led to do a safer business Competition will stimulate the manufacturer to invent and to economize, while it ought to make the jobber cautious and energetic. There are now several manufacturing concerns in the United States having so many agencies that they ignore all "specials" to jobbers. Concerns of this class have been so successful that their progress must awaken attention. When the jobbing trade resorts to "cuts" and to giving away its legitimate charges the manufacturer should see to it with all diligence, for "there is something rotten in Denmark."

A Western manufacturer of Heavy Hardware writes: "We have been quite successful in confining the jobbers to our regular rates in the small line of goods which we manufacture; our private opinion is that the fact that so many of the manufacturers go direct to the consumers and small buyers has had considerable to do with the tendency of the jobbers to cut prices and give away their profits, from the feeling it has raised that they have to compete with the manufacturer as well as with their fellow jobbers; this, of course, does not apply to all manufacturers, but there are enough of them who pursue these demoralizing practices to unsettle the confidence of the jobber in the stability of any prices."

The following frank and sensible letter is from a Western manufacturer, and touches a point in this controversy in regard to the small manufacturer that will account in a measure for the evils complained of:

We do not see how any effectual remedy can be applied to prevent the demoralizing practice now adopted by many of the leading jobbers, unless it be by concerted action on the part of manufacturers, which, owing to the fact that many jobbers are in reality manufacturers themselves, would hardly be practicable. It is a well-established fact that by reason of their financial weakness many small manufacturers of first-class lines of goods are to a great extent placed at the mercy, so to speak, of one or more of the large jobbing houses handling their goods, and are literally bound hand and foot as regards the conduct of their business in the matter of discounts For those among the manufacturers who are in a position to maintain themselves in such a course it would seem advisable to take their trade in hand among the best class of retail dealers, and give them the benefit of the jobbing discount. During the past two years we have adhered rigidly to one rule regarding discounts on special lines of goods, and have repeatedly refused trade when a violation of this rule was the alternative. To our leading jobbers, for instance, we give 40 per cent., 60 days; 2 per cent., 10 days, and no more; to such jobbers as they might properly consider customers, 30 and 5 per cent., 60 days, and 2 per cent., cash; to leading retailers, when asked for quotations, 25 per cent., 60 days; 2 per cent., 10 days. The dullness of trade, together with a large amount of overproduction in many lines of manufactured goods, has tempted the manufacturer to submit to dictation on discounts from the wealthy jobbing houses, forgetting, as he evidently must, that on the return of good times they will naturally expect the same concession, he having allowed them to establish the precedent. The practice among jobbers of obtaining special rates of discount from the manufacturer, and then insisting on his delivering the goods at their door, is one which all manufacturers should discountenance. There is no more reason why the manufacturer should pay freight for the jobber than that the jobbers should pay it for the retailer.

We conclude this week's extracts by a letter from an Eastern firm of mill furnishers, who suggest a good, but not always practicable, remedy—that of refusing to sell to parties who have broken prices:

We are very glad that you have taken hold of this matter, for to our mind it is of great importance, and if it was better understood intelligent jobbers would better serve their interests by retaining the margin allowed by the manufacturers, which is in most cases only enough to fairly support the trader. As a means to this end we are strongly in favor of the plan adopted by a few manufacturers—viz., to refuse to sell parties having broken the price made by the maker. We have seen dozens of dealers go out of business because they were disposed to sell goods without an adequate margin, and an unjust desire to cut prices on goods where rates are established by the makers. Let the jobber realize that it is a benefit the maker gives him in making him a discount beyond the retail price.

New York Iron Market.

The general condition of the Iron trade continues about as reported for several weeks, but a few large transactions have occurred in some branches. The most important is the contract made by the Kings County Elevated Railway Company, of Brooklyn, with the Phœnix Bridge Company, of Philadelphia, involving the construction of about 14 miles of bridgework, to be completed in two years, at a cost of about $10,000,000. The quantity of Iron required for this structure is not stated. At present there seems to be a little difficulty about beginning the work, owing to obstacles interposed by the Brooklyn authorities, but it is hoped that they will prove only temporary. Transactions in Steel Rails have again been very large, with the probabilities in favor of the continuance of heavy business in this line. The Catasauqua Manufacturing Company report the largest single sale of Bar Iron they have made this year, consisting of 1000 tons for carwork. Outside of these transactions the Iron trade has been quiet, with no manifestations of an early resumption of activity.

American Pig.—Business is still confined to small lots, buyers ordering only when they are in absolute need of stock. There seems to be a dread of an accumulation of raw material among foundrymen, as so many of them are endeavoring to keep their yards absolutely bare. When they do order they are in such haste for deliveries that sail and steam are hardly fast enough for them. It is remarked by many sellers that there is but little effort now made to get prices lower, quotations made being accepted without question, the presumption being inferred that prices are considered low enough. Stocks in makers' hands in near-by districts are not accumulating, and some agents report an actual decrease, thus indicating that production has been curtailed within the limits of consumption. The demand, however, is very disappointing, as expectations had been generally entertained of an improvement in trade by the 1st of September at the furthest, but so far there are no signs of it in this vicinity. Outside Irons are not so abundant as they were, and we learn of the recent blowing out of one large Virginia furnace, whose product has been quite extensively sold in this market, the discontinuance of its operations being ascribed to the unprofitableness of business at the prevailing rates. Quotations of standard Lehigh brands continue as follows, tidewater delivery: No. 1 X Foundry, $20 @ $21; No. 2 X Foundry, $18.50 @ $19; Gray Forge, $17 @ $18. Outside brands, $1 @ $2 cheaper.

Scotch Pig.—The upward tendency in makers' quotations in Scotland has not influenced this market as yet, the demand continuing light, and prices ranging as previously quoted. It is believed that if prices advance much further at home the only effect to be observed in this market will be the discontinuance of importations. As it is, arrivals are growing lighter, the past week witnessing only about 800 tons imported. Most of this was, as usual, sold to arrive. We quote prices as follows, the only variations being in offers of dock lots occasionally at slightly lower prices: Gartsherrie, $21 to arrive, $22 from yard. Shotts, $21.50 @ $21.75 to arrive, $22 from yard; Langloan. $21.50 to arrive, $22 from yard; Carnbroe and Glengarnock, $20.50 to arrive, $21.50 from yard; Coltness, $22 to arrive; Summerlee, $20.75 @ $21 to arrive; Dalmellington, $20 to arrive; Eglinton, $19.25 @ $19.50 to arrive; Clyde, $20 to arrive.

Bessemer Pig and Spiegeleisen.—No transactions are reported in Foreign Bessemer Pig, nominal quotations being $19 @ $19.50. In Spiegeleisen we hear of but one sale—500 tons of 30 % at $31, for shipment. Quotations of 20 % range from $27 to $28. Spiegeleisen is evidently sympathizing with Steel Rails, quotations slowly moving downward.

Bar Iron.—Business generally has been very light, and agents, as a rule, are booking few orders for mill lots. An exceptional sale has been made by the Catasauqua Manufacturing Company, however, consisting of 1000 tons for carwork, which, they say, is the largest single order for Bar Iron they have taken this year. Store trade is still dull. We quote as follows: Best Refined, at mill, 1.75¢ @ 2¢; from store, 2.1¢ @ 2.25¢; Common Iron, at mill, 1.55¢ @ 1.7¢; from store, 2¢ @ 2.1¢. Concessions are occasionally made on store prices

Structural and Shaped Iron.—With the exception of the Kings County Elevated Railway contract, mentioned above, we hear of very little new business in this direction. There are some new buildings under way, however, which will require a considerable quantity of Beams. For small lots quotations continue as follows: Angles, from store, 2.4¢ @ 2.6¢; Tees from store, 2.9¢ @ 3¢; Beams and Channels, on dock, 3.5¢.

Plate Iron.—The demand is a trifle more active than it was last week, but orders are generally very small, quotations ranging about as follows for small lots: Common or Tank, 2¼¢ @ 2⅜¢; Refined, 2½¢; Shell, 2¾¢; Flange, 3¼¢; Extra Flange, 4¼¢ @ 4¾¢.

Sheet Iron.—Trade is moving only sluggishly, the Stove manufacturers not moving vigorously in the matter of laying in supplies until cooler weather admonishes them of the approach of winter. We quote prices in our list of New York Wholesale Prices.

Steel Rails.—The sales of the week have been quite heavy, transactions for Eastern and Western account being reported aggregating considerably over 50,000 tons. Numerous inquiries are still in the market, and negotiations are progressing for large blocks. Prices at Eastern mills are no better than they have been, the sales of the week, it is reported, having been made mainly on a basis of $27 at works. Notwithstanding the large amount of work entered for fall and winter delivery during the past month, the Steel Rail companies are still competing vigorously for the business in sight, their capacity being very great. Of the orders taken during the week the Worcester Steel Company are understood to have secured a moderate share. We quote $27 at Eastern mills.

Merchant Steel.—At length some slight improvement in this line is perceptible, and hopes are entertained of an increasing trade with the advancing season. We continue to quote prices as follows: American Tool Steel, 10¢, with a concession to large buyers; Crucible Machinery, 5½¢; Open-hearth Machinery, 3¼¢ @ 3½¢; Bessemer Machinery, 3¢; Tank Steel, 3¼¢ @ 4¢; Boiler Plates, 4¼¢ @ 5½¢; English Tool, 14½¢ @ 15½¢. The demand for Steel Plates for general purposes is reported very good.

Steel Wire Rods.—Trade is dormant. Nominal quotations continue at $46.50 @ $47.

Old Rails.—The supply of Old Rails is now quite limited in this vicinity, and holders are asking higher prices for the few lots available, ranging from $19 to $20. Buyers offer $17.50 @ $17 75. A fair quotation at this point would probably be $18 @ $18.50, but, of course, much would depend upon the necessity of the seller or the anxiety of the buyer, as well as the quantity and quality of the Rails offered or sought for. Transactions are reported as follows: 400 tons at a Sound port, and 460 tons delivered at Boston, both on private terms, the transactions involving other considerations than price, and 4000 tons at Buffalo at $18.75.

Scrap Iron.—Very light business is reported for the week under review. We quote nominally $19 @ $20 for No. 1 Wrought from yard.

Metal Exchange.

We are reported the following sales as having occurred on the floor of the Exchange since those mentioned in our last issue:

THURSDAY, August 28.

10 tons	Tin, Aug	$0.1815

TUESDAY, September 2.

10 tons	Tin, Sept	.1815
10 "	" "	.1815
10 "	" "	.1815

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., Chattanooga. September 1, 1884.

There is a more cheerful feeling in Southern business circles than has existed for some time. Whether it is based on mere expectation of better times or has something substantial beneath it in the form of better demand cannot yet be seen. Low prices rule in every line, but it is claimed that consumers are showing more disposition to buy than lately, and this is certainly true as to one or two leading articles. The South got the benefit of the northwestern cool wave, and relief from the oppressive heat of the two previous weeks has helped the spirits of dealers. Heavy rains during the week have materially improved late "truck" and farm crops.

Pig Iron.—One feature noticeable in the market is more disposition among consumers and dealers to buy. Several thousand tons changed hands direct from furnaces managed at this city, the prices for No. 1 Foundry being $15 @ $16, cash, on cars at furnace. We hear of Coke Mill Irons of the Birmingham district being laid down in Chicago at $14 50. If it is true, there must be some mysterious freight rate in the business, as the usual charge would bring the price of the Iron about $9.50 at the furnace. The strong companies in this section will be banked, provided the necessary two-thirds come into the scheme, but managers are rather indifferent to the movement. We quote small lots, 60 days: No. 1 Foundry, $17 @ $18; No. 2 Foundry, $16.50; Gray Forge, $14 @ $15; White and Mottled, $13 @ $14; Car-Wheel Metal, $22 @ $24.

Ores.—We quote Fossiliferous Ores, averaging about 50 % Metallic Iron, $1.50 ₱ ton, delivered at river landings; higher qualities, $2. Brown Hematite, $2 @ $2.25 on cars at furnace.

Miscellaneous Articles.—Old Rails, $16; Wrought Scrap, $11 @ $14; Old Wheels, $16; Cotton Tie Clippings, $10. There is nothing doing in this list.

Merchant Iron.—Bar dull at $1.70 for car lots; Spikes, $2.25; Bolts, $2.50 @ $2.75; Splices, $1.70.

Nails.—The demand for Nails is brisk at $2.15 for large bills.

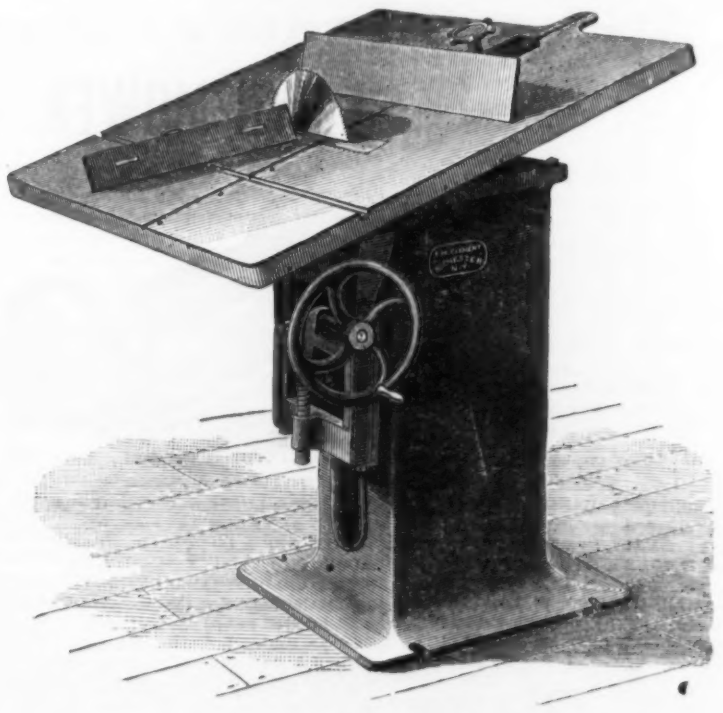
Barb Wire.—Cambria Link and Four-Point, Galvanized, 6¢ ₱ lb.

Coal.—We quote Fancy Lump at $3; Common Lump, $2; Egg, $2.25, delivered. Run of mine to manufacturers, $1.50 at mills.

Coke.—We quote at $2 @ $2 25 at furnace; Foundry Coke at 8¢ @ 10¢ ₱ bushel.

Iron Saw Bench.

Frank H. Clement, Rochester, N. Y., is introducing a new design for a small cut off and splitting saw bench, suitable for use in



IRON SAW BENCH.

pattern shops, carpenter shops, furniture factories, car works and in all other wood shops where light and accurate work is done. The general appearance of the bench is clearly indicated in the engraving herewith. The table rises and falls, in a direct line, 5 inches. It is moved by means of the large hand-wheel and screw shown in the cut. The table also tilts to saw beveling, and swings upon trunnions, thus permitting of the removal of saws and the oiling of bearings. Iron gauges for cutting off and slitting are provided, both of which can be adjusted to any angle up to 45°. With this machine ordinarily a hardwood table is furnished, glued up in strips and bolted fast to heavy segment bars to prevent warping. We understand from the manufacturer, however, that, when so ordered, an iron table is furnished with a hardwood center piece. The manufacturer states that all the parts are well fitted and adjusted true and square. The arbor runs in self-oiling boxes, and is nicely fitted with means of taking up end motion.

The Supply of Natural Gas.

Thomas N. Miller, of the Atlas Works, in an interview with a reporter of the Pittsburgh *Dispatch*, recently said that he thought the supply of natural gas would continue for an indefinite period by drilling new wells. Professor Lesley, in his work on the geology of Pennsylvania, gives three divisions in connection with oil and gas. The inner and narrower lines define the limits of the light oil. The next lines, which take in a larger territory, define the limits of heavy or lubricating oils. The outer lines take in the gas district, and embrace a territory extending from Southern New York to and including Kentucky; and in width from about McKeesport to Lake Ontario, and under it to Canada, covering an area of 200,000 square miles. This is about the territory in which gas is found. Of course it is not attainable at every point within these limits, and yet it is attainable at the extreme limits. There are flowing gas wells at Crestline and Painesville, Ohio. At Olean and other points in Southern New York, and as far south as Kentucky, both oil and gas are obtainable. Gas should be found at the least depth at Wood's Run, as the anticlinal of the territory passes through that point nearest the surface. Going northeast, it should be found at a lesser depth, and southeast at a greater depth, and to the right or left of this line at a greater depth.

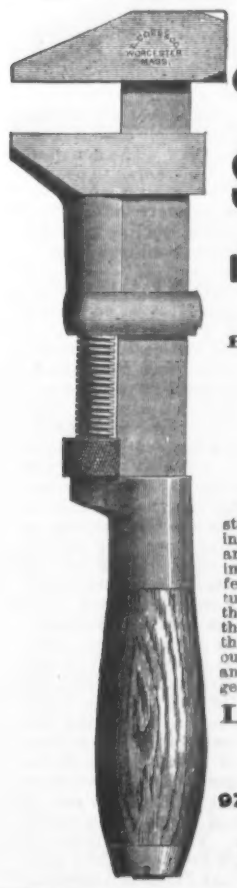
Like oil wells, gas wells are exhausted by means of paraffine, sand and other substances, which flow with the airy fluid, and eventually stop up the well. This can only be remedied by reboring or the boring of new wells. Gas wells are not liable to clog up as rapidly as oil wells, on account of the rapid flow of gas. The average age of an oil well was formerly about a year and three-quarters, but by the aid of appliances it has been increased to four years. The age of a gas well is usually 12 or 14 years. The gas wells thus far struck are very diminutive, as compared with the capacity of mother earth. Supposing that it exists like the coal which underlies Allegheny County, it would take ages to exhaust it.

Chemists place natural gas as being worth 6 cents a thousand cubic feet, as compared with nut coal at 5½ cents a bushel. In other words, a bushel of nut coal is equal to a thousand cubic feet of gas. But the gas would really be worth about 10 cents, when the cost of hauling the coal, ashes, &c., and the wear and tear of the grate bars is considered. To complete a gas well costs about $5000. Three million cubic feet of gas per day is not an extraordinary yield for one well. Placing the age of the well at 10 years, and allowing for the diminishing of the well, that it will produce only half of 3,000,000 feet a day, the value of the gas produced by one well, as compared with coal, would be over half a million dollars. The Pittsburgh Plate Glass Works, at Creighton Station, on the West Penn Railroad, are run entirely with gas. The well cost the company $10,000. To run the works 3000 bushels of coal per day would be required. At 6 cents a bushel the cost would be $180 a day or over $70,000 a year. This is a clear gain of that amount, as the cost of handling the coal and ashes would be more than the interest on the first cost of the well and the cost of keeping it in repair, which is very slight. Thus the Pittsburgh Plate Glass Company's fuel costs them comparatively nothing At Jones & Laughlins' mill on the Southside, nearly all of the puddling and heating departments are run with gas. Their coal bill for the same work would be over $100.000, Wilson, Walker & Co. save over $20,000 a year by the use of gas in their puddling departments. Carnegie Brothers use gas in some departments instead of $100,000 worth of coal a year. Even allowing that the gas cost them as much for fuel as coal, the saving in handling the latter would be $20,000 or $25,000 a year. The time was when the Penn Fuel and Fuel Gas companies had a monopoly, and they have yet, so far as that is concerned. But when this gas belt is developed more fully, and all producers have the right to convey and sell their gas anywhere in the city they may desire, the cost of gas as a fuel will be almost nothing.

There is one great advantage in finding gas at its extreme depth, as is the case in Pittsburgh. Where it is found at a great depth it is more likely to be lasting. The greater the pressure of the earth on it, the greater will be the force with which it will come out. At those wells which are only 500 or 600 feet deep a large pipe is required, and the gas does not come out with such force or in such great quantities. Therefore, Pittsburgh is very favorably situated for a permanent supply. About 10 years ago Mr. Miller said he constructed the machinery for making carbon black from gas, which is done at Saxonburg, on the Butler branch of West Penn Railroad. The gas wells from which the black is made are still producing as fully as they were when the works were erected. This carbon black is used in making the finest inks, with which illustrated newspapers and magazines are printed. Unless gas is struck at the other manufacturing centers, he did not see how manufacturers of other cities could expect to compete with Pittsburghers, unless they removed their works to that place.

The State Department has received information that the King of the Belgians has issued a decree for the protection of exhibitors at the exhibition to be held at Antwerp in 1885, which provides that the exhibitors of articles which can be patented or copyrighted shall be entitled to receive certificates conferring upon them the same protection as if their articles had been patented or copyrighted, this protection to extend to the third month following the close of the exhibition.

The effective armored fleets of the leading naval powers of Europe is summarized as follows: England, 329.520 tons; France, 201.789 tons; Germany, 74,007 tons; Austria, 63,110 tons; Russia, 83,621 tons; Italy, 59,905 tons.



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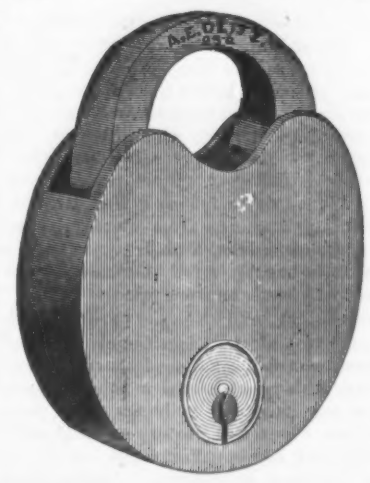

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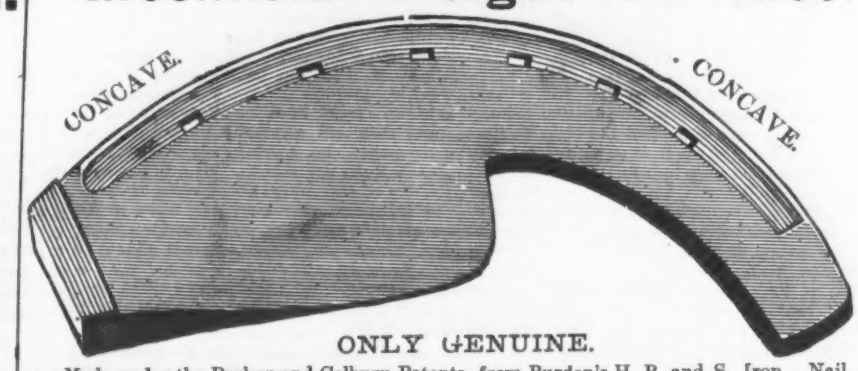

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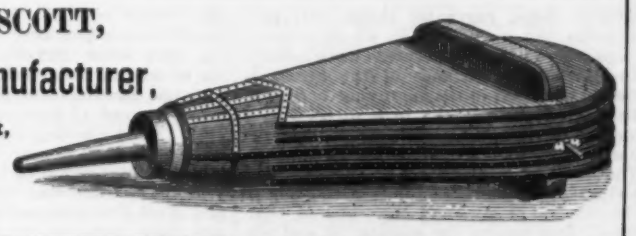

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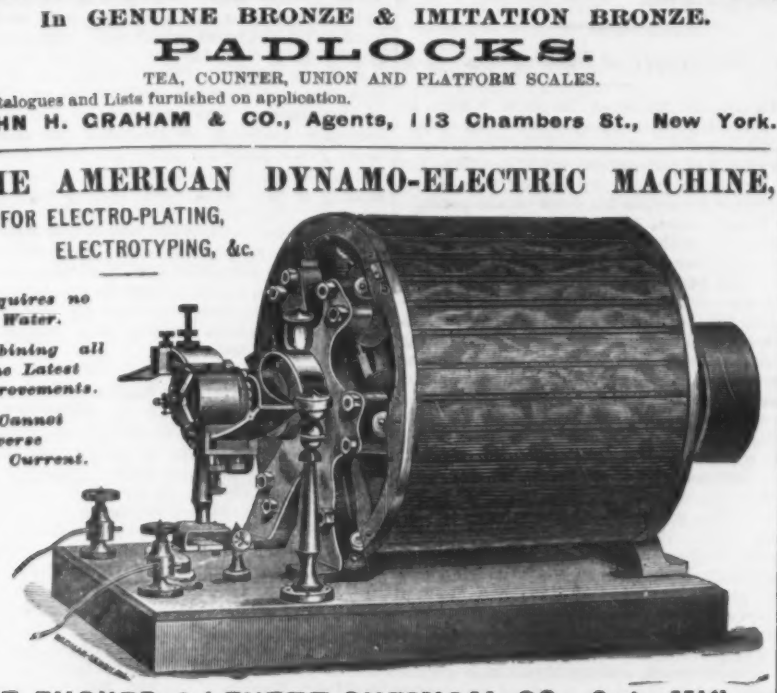

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English Letter.

(*From Our Regular Correspondent.*)

LONDON, August 18, 1884.

THE SITUATION

is not worse, on the whole, since I last wrote, nor do I think it is any better, despite the excellent effects of the fine weather, the capital harvest, and a few odd influences which have had or are having a certain weight with those whose inclinations and aspirations are of a sanguine character. That the situation is no worse is, perhaps, something upon which we may take occasion to congratulate ourselves. That it has not undergone any special improvement in the course of a week is not by any means surprising. The summer is a revelation the like of which we have not known for many years past; but so far no revelation and no revolution, either, have arisen in the commercial or industrial situations. We have had the thermometer at 150° in the sun and 97° in the shade since I last wrote, and to that extent have been exhilarated, except at the iron and steel works, where some of our hard-working fellow-men have had to suspend their arduous operations during the hottest part of the day. In general we are encouraged by the knowledge that much of the harvest has been gathered in magnificent condition, and in particular we hear rumors that the "fall" (we call it autumn) trade is beginning to show symptoms of being good, and probably heavier than for some years past. Still, "we are not happy," and desire to witness some more tangible tokens of that revival for which we are all so ardently longing. We know that matters remain very dull in most of our manufacturing industries, and the excessive bareness of selling prices is the theme of almost universal complaint. We look forward to the realization of reasonable profits on work done, and pray for some diminution of that fierce competition by which almost every manufacturer is assailed on all sides and in every market, not excluding our own. To this it is probably a far cry, but the prospect is a pleasant one, and, all things considered, it is not so bad to look forward to it as to bewail our present hard fate and lean condition.

In their efforts to keep pace with competition and its effects, the Northern as well as the Staffordshire ironmasters have deemed it necessary to give notice of further reductions of the wages of their workmen, who are organizing resistance and threaten strikes. The employers do not deny that wages are low—lower, indeed, than they like to pay—but they point out that they have no choice at all in the matter. They must either reduce the men's remuneration or cease to produce, so that with them, as with their men, it is a question of necessity—which is, axiomatically, subject to no laws. Probably a middle course may be found which will yield the proverbial safety to both parties. Our men of science, as well as many who are not at all scientific, are just now leaving these shores in large numbers for Canada and the United States, the majority of them in connection with the British Association. Several hundreds have already left and hundreds more are about starting, so that there is every reason for believing that the gathering will be a great success. The steamship companies and railways are certainly offering great inducements and concessions to the travelers. Among the Britishers who have just left (per Germanic) for the United States is Mr. J. E. Bingham, head of the silver and electroplate firm of Walker & Hall, Sheffield, and master cutler elect (for the second time) of the Cutlers' Company of that town.

THE IRON MARKET

has not improved to any appreciable extent during the week, although there is in some quarters a disposition to view the outlook more hopefully. Some portion of this more sanguine feeling is the outcome of the continued fine weather, and the assurance of a good harvest in consequence, while a rather better tone has made its appearance in the North of England and Scotland, owing to the advent of new orders for shipbuilding on the Clyde. The reports as to the extent and nature of these orders are somewhat contradictory, but it seems certain that several contracts have been placed, while there are said to be inquiries in the market for further work of the same class. To what extent this may benefit the iron trade yet remains to be seen, but at the moment it appears somewhat doubtful whether anything like a sustained spurt will be administered thereby. It is possible, of course, that the plentiful grain crops of the world may shortly give enhanced employment to shipping, but there are at present no signs of an augmented carrying trade, and the excellent harvest throughout Western Europe will naturally tend to restrict the demand for American or other wheat. The most important iron trade news of the week reaches us from the United States, whence it is cabled that the furnace owners have virtually decided to wholly suspend operations during the next two months. According to the cablegram, the proposition to this effect needs a vote of three fourths of the ironmasters to carry it, but it is said to be probable that there will be no difficulty in so settling the matter. In that case the step will represent the most formidable embodiment of the policy of restriction the world has yet witnessed, always supposing, of course, that it is really intended to stop the whole of the American furnaces.

At Glasgow the week opened with greater firmness, owing to the reported improvement in the shipbuilding trade, and a fair amount of business has been done throughout, the closing price being 41/5 ₹ ton. Scotch makers' brands are steady and without other than minor changes in value, although current shipments compare badly with those of last year, and stocks are still extremely heavy. At Middlesboro' pig iron is weak and irregular on the basis of 36/3 @ 36/6 for No. 3, and other numbers *pro rata*. The shipments of Cleveland pig to Scotland were rather larger last week, but foreign shipments are not up to the mark, and there are good reasons for believing that stocks are still growing. On the West Coast hematite pigs are nominally unaltered, but are really weak and irregular on the basis of 44/ @ 45/6 for mixed lots in usual proportions, with makers' brands at about 45/ @ 46/ for No. 1, 44/6 @ 45/ for No. 2, and 44/ @ 44/6 for No. 3 sorts. In the other smelting districts matters are very quiet at about late rates, but there is abundant evidence that the make is largely in excess of the consumptive requirements of the market, and that the large reserve stocks encourage buyers to beat down prices to the utmost. Deliveries on regular contracts are pretty large, but the surplusage appears larger than it was during last quarter. In heavy manufactured iron a little better tone has been noticeable, especially in shipbuilding sorts, but we do not hear of any appreciable augmentation of the demand. Ordinary finished iron is virtually unchanged; but few of the mills and forges are doing more than about half or two-thirds of their full capacity, and many of them are quite short of orders. The great heat of the week has caused a limitation of the make in many quarters. Scotch bars are £6 @ £6. 5/; hoops, £7 @ £7. 10/; nail rods, £6. 5/ @ £6. 10/; angle iron, £6. 10/ @ £7; boiler plates, £6. 10/ @ £7, and ship plates, £6. 5/ @ £6. 15/ ₹ ton. In the North of England common bars are to be had as low as £5. 5/ @ £5. 10/, and ship plates at £5. 10/ @ £5. 12/6. For marked Staffordshire bars the "list" price is still £7. 10/, but excellent bars are to be obtained at £6. 5/ @ £6. 15/, and common ranges down to £5. 10/, with ordinary Welsh bars in India assortments at £4. 17/6 @ £5 ₹ ton, f.o.b. Sheets are very quiet at recent figures, and the mills are poorly employed. For hoops and strips also the demand is limited. A few houses are doing moderately well in chain and cable iron.

Galvanized sheets are irregular in price and in very moderate request, which remarks also apply to fencing wire. For old D. H. rails, stocks of which are light, the current rates are £2. 10/ @ £2. 15/; No. 1 heavy wrought scrap, £2 @ £2. 2/6; cast scrap, £1. 19/ @ £2. 5/, and old boiler tubes, £2. 10/ @ £2. 15/ ₹ ton. The American demand for these old materials appears to have fallen off almost entirely. Freights are easy and nominal at my late rates, except that pig iron by ordinary steamers, Glasgow to New York, is now 3/ ₹ ton. From Glasgow by sailing vessels pig-iron rates are; Buenos Ayres, 30/; Monte Video, 30/; Montreal, 12/6; New Orleans, 15/; New York, 7/6; Philadelphia, 10/; Portland, 13/; Providence, 12/6; Rangoon, 35/; Rio Janeiro, 20/; San Francisco, 20/. There is no change from the 5/ freight on tin plates by American steamers from the Mersey. Another steamer has been fixed from Newport for the third week of this month in addition to the two already announced. Steel remains quiet, so far as the Sheffield older sorts are concerned, but the Bessemer and Siemens works are fairly engaged on rolled sorts for a great and growing variety of purposes. Crop ends are nominal at about 50/ @ 52/6, and are scarce in some quarters, owing to the reduced output of rails. Steel scrap is quiet and neglected for export. Steel rails present no new features, the base price of the combination being, as before, £4. 15/ at the works for ordinary heavy sections.

Tin plates are firm and have a distinct tendency to advance, the good American inquiry being supplemented by large buying on Continental and Colonial account. Cokes are variously quoted at from 15/6 to 16/6 I. C., while "charcoals" of steel with good finish are 17/6 @ 19/6. Ternes are in slight oversupply at the moment and are called 14/ @ 15/6. For coke tin wasters the price ranges at about 14/ @ 14/3 ₹ box. All the works are fully engaged and mostly freely sold forward.

SCOTCH PIG IRON

is somewhat unsettled as regards warrants, owing in a great measure to the contradictory reports which have been circulated as to the quantity of new shipping recently ordered. As I told you last week, the quantity was then said to be 50,000 tons, with inquiries for another 50,000 tons, but it is now asserted, on what is apparently good authority, that the new contracts do not represent more than 24,000 tons, mostly for sailing vessels. The market for warrants, which spurted on the first announcement, has now relapsed and prices are not better than they were about 10 days ago. Shipments are much below those of the corresponding period of last year, and up to date they are greatly behind. Stocks decrease in a very desultory manner and now amount in Connal's stores to 586,835 tons, as against 584,000 tons a year ago. It is evident that the 95 furnaces now at work (as compared with 114 last year this date) are making more iron than can be properly disposed of. Middlesboro' imports into Scotland increased last week, but are still 7000 tons behind. Present prices of Scotch pig iron are:

Deliverable alongside.	No. 1.	No. 3.
Gartsherrie, at Glasgow	51/6	49/9
Coltness, "	57/6	51/
Langloan, "	55/6	51/3
Summerlee, "	50/6	47/
Calder, "	51/6	48/9
Carnbroe, "	50/	46/6
Clyde, "	48/	45/
Monkland, "	43/6	40/6
Quarter, "	42/	40/3
Govan, at Broomielaw	42/6	40/6
Shotts, at Leith	51/6	51/
Carron, at Grangemouth	48/	47/6
" " specially selected,	54/	....
Kinneil, at Bo'ness	44/	43/
Glengarnock, at Ardrossan	50/	43/
Eglinton, "	44/	40/6
Dalmellington, "	46/9	42/6

IRONCLAD VESSELS.

For some time past members of Parliament, public writers and others have noticed that the Government of France has been making most strenuous efforts to extend and improve the navy of that country. Enormous sums of money have been expended, and all parties in the State appear to be well content to sink their differences in favor of the efficient prosecution of the scheme. Why such should specially be the case is unknown to the great majority of persons in this country, but the fact that we are even threatened with a rival in our supremacy of the seas is a most disquieting idea to the average Britisher. In the main our naval traditions are glorious, and we are well content to concede supremacy on land to other nations so long as "Britannia rules the waves." Now that France appears to be coveting our prize distinction, the older and many of the newer types of politicians are especially anxious that we should also go ahead and at all hazards retain and maintain our maritime prestige. Pamphlets are being circulated in proof of the inglorious inaction and ill-timed parsimony of our own Government, and speeches are constantly made in which we are declared to run every possible risk of being outpaced by our pugnacious Gallic neighbors. The French are building ironclads galore. Should we not, therefore, push on with our marine monsters? The question requires consideration before a reply is given. The official mind seems given up to these huge structures of iron and steel, but many persons are convinced that it is a serious mistake to thus expend our money and concentrate our offensive and defensive forces. These persons very properly point out that the ironclads can scarcely be kept afloat in this time of peace and fine weather, while it seems to be a certainty that if two of the monsters touch each other one (or both) goes to the bottom. It is urged, therefore, that we should preferably create a swarm of smaller vessels—gunboats, swift of motion, cheap in construction, easily handled, of low displacement and efficient in action, without being too easily silenced by larger rivals. At present this policy finds scarcely any official support, but its friends feel sure of their case and aver that the first great naval engagement will demonstrate the soundness of their views.

INDUSTRIAL ITEMS.

MAINE.

The New Brunswick Foundry, at Woodstock, have this year turned out 340 mowers, 375 wheel rakes and 275 steel plows.

NEW HAMPSHIRE.

George A. Rollins & Co., builders of the Rollins automatic cut-off steam engine, at Nashua, have their new shops all completed and several engines under way.

MASSACHUSETTS.

The following is an interesting nail item: Several installments of machinery have been received at the New Seconnet Mill, Fall River, including five of the boilers and a large number of pulleys and heavy hooks for suspending them. The upper flooring of this mill is of birch and maple, instead of hard pine, as in other mills, and it is stated to have much greater durability than pine. The hardwood floor is laid across the heavy plank floor underneath and thoroughly nailed—a job that has not only much noise, but requires much time. The workman at this nailing sticks several hundred nails in the floor at the measured points, and then with a light sledge hammer proceeds to drive the whole mass of nails, perhaps bringing that sledge down 1000 times before stopping. Eleven tons of nails and spikes will be used in the construction of the mill.

The Lamb Knitting Machine Company have received an order for 100 machines from Germany.

On the 23d ult., at Worcester, William Allen & Sons poured, at the foundry connected with their boiler works, the largest fly-wheel ever cast in that city. The wheel, which is to form a part of a 600-horse power, engine, is 24 feet in diameter, with a 40-inch face, and will weigh when completed about 14 tons. One peculiarity of the casting is that it is what is known among founders as swept work, the mold being swept up and formed without any pattern. The pouring-boxes are in the form of a letter Y, with a stem about 8 feet long, and arms about 12 feet long, with channels over 1 foot wide and about 10 inches deep, with openings in the bottom to let the metal through into the mold beneath. These pouring-boxes are over the mold on either side of the rim of the wheel.

CONNECTICUT.

G. H. Hardman, formerly of Lowell, Mass., and now in the employ of the Union Hardware Company, of Torrington, as tool-maker, has constructed a machine for drilling "carriers" for roller skates, in which four drills work nearly at once. The machine is an ingenious combination of gearing cams and springs, and does the work with speed and accuracy. By the old method only one drill could be operated on those castings at once.

The Cole Manufacturing Company, of Unionville, are engaged in building a large factory at Bridgeport, and as soon as completed will remove from Unionville to Bridgeport, and will resume the manufacture of light hardware.

NEW YORK.

The Eagle Iron Works (foundry) of Charles Freiting & Co., in the Eastern District of Brooklyn, was struck by lightning on August 30. The foundry was a 1-story structure with a cupola, in which nearly a ton of iron was in the process of melting. The top was knocked off by what appeared to be a ball of fire which came from the clouds at the moment that a tremendous clap of thunder was heard. The lightning then passed off harmlessly, but the heavy rain which poured in among the masses of half-molten metal in the cupola was converted to steam by the heat so suddenly that a violent explosion occurred. It shook the entire neighborhood and scattered liquid iron through the foundry shed and the adjoining streets. Two workmen were hurt by the falling cupola. The damage is estimated at $5000.

The heaviest hammer in the Morgan Iron Works of John Roach & Son, situated at the foot of Ninth street, New York, is described as follows: Moving mass of stem, 20,000 pounds; steam pressure on down stroke of piston, 88,357 pounds; length of stroke or fall, 7 feet. A new hammer of the following size, now under construction, will shortly be added to the plant: Moving mass, 50,000 pounds; steam pressure on down stroke, 225,000 pounds; length of stroke or fall, 10 feet.

The Aland Blower Company, of Rome, have in contemplation the erection of a large building next their machine shop, to be used for a finishing and store room.

The Kilmer Wire Band Manufacturing Company, of Schenectady, are erecting a 40 x 100 foot addition to their ornamental wire fence factory.

As a sequel to the suspension of the West Point Foundry Association, Paulding, Kemble & Co., who for a number of years carried on the business of iron founders at Cold Spring, and were succeeded in August, 1883, by the West Point Foundry Association, made a general assignment on the 30th ult. to Chas. J. Nourse, preferring the National Bank of the Republic, New York; Emily P. Paulding, S. H. Kohn and the First National Bank of Fishkill, N. Y., for what may be due each of them. The firm was composed of Gouverneur and James N. Paulding, and Peter and Gouverneur Kemble. Gouverneur Paulding is the president of the Foundry Association, Gouverneur Kemble vice-president, and James N. Paulding secretary.

NEW JERSEY.

One of the largest manufacturing concerns in the world is the Singer Manufacturing Company, of Elizabeth, which at the present time are turning out 3500 sewing machines daily, and have in their employ over 40,000 people and nearly 15,000 teams.

The nickel works in Camden, belonging to Joseph Wharton, and which are the only works of the kind in this country, resumed operations on the 1st inst., having been idle since January 1, 1883. At the time the works stopped there was an oversupply of metal, which has now been absorbed. About 90 hands are employed.

DELAWARE.

The new glass works of the Wilmington Glass Company, of Wilmington, and of the Dover Glass Company, of Dover, were set in operation on the 1st inst. The first glass ever made in Delaware was blown shortly after midnight, at the Wilmington factory.

PENNSYLVANIA.

An explosion of gas at the Thomas Iron Company's work, at Hokendauqua, set on fire the buildings, doing damage to a slight extent.

The Jackson & Woodin Manufacturing Company, of Berwick, have just closed a contract for 200 cars for the Delaware, Lackawanna and Western Railroad.

The Hazard Manufacturing Company, of Wilkes-Barre, have just completed a wire cable for the Third Avenue Railway Company of New York, measuring over 6 miles long.

The Crane Iron Company, of Catasauqua, have announced a reduction of 10 per cent. in the wages of their employees, to take effect September 1.

Lemont Furnace, in Fayette County, is to be repaired and remodeled, with the object of increasing the capacity of the furnace.

Fannie Furnace, at West Middlesex, was blown in during the latter part of last week, the men having accepted a 10 per cent. reduction until such time as the proprietors can secure sufficient orders to dispose of their iron as fast as manufactured.

The Crane Iron Company are preparing for the manufacture of Bessemer pig iron. If the experiment proves successful the company will be able to secure orders to keep at least one furnace in blast for a year or more.

The Union Foundry and Machine Company, of Catasauqua, have nearly finished their new foundry, which is 60 x 100 feet. Work is expected to begin the second week in September. The business of this concern has become so extensive that this improvement was a necessity.

At the Baldwin Locomotive Works, in Philadelphia, workmen are busy removing all traces of the recent fire. On Broad and Hamilton streets the foundations for the new buildings are already in place and the superstructure is being rapidly erected. The works are fairly well employed and are in a position to give orders as prompt attention as before the fire. The last one of 10 freight engines, built for export to Sydney, N. S. W., was finished this week, and will complete the cargo of a sailing vessel which is to leave New York in a few days. An order for 14 heavy freight engines for the Wabash and Missouri Pacific Railroad is now under way and will be completed in a short time.

PITTSBURGH AND VICINITY.

The works of the Spang Steel and Iron Company, of Pittsburgh, contain a 7-ton Siemens-Martin open-hearth furnace and a 7-ton Pernot open-hearth furnace. The latter is being torn down, and will be replaced with a 14-ton Siemens open-hearth furnace. On Tuesday of last week these works rolled two steel plates, each 25 feet in length, 84 inches in width and 5/8 inch thick. The ingots weighed 4750 and 4725 pounds. The rolling occupied the train less than half an hour. The plates are said to be the heaviest steel plates ever rolled in Pittsburgh. They are to be shipped to San Francisco. The same train the previous week rolled a plate 12 feet by 111 inches by 3/8 inch.

The syndicate gas well on the property of Park, Bro. & Co., has been abandoned on account of the enormous flow of salt water. It is reported that the syndicate will drill another well in a different location.

The following notice was posted in the Westinghouse Air Brake Works, in Allegheny, on August 27: "All departments will go on half-time, to commence on Monday next, with the exception of the blacksmiths' shop." This order will affect about 350 men. The force employed there has been greatly reduced by sweeping discharges. Those remaining will after Monday go to work at 8 a. m. and quit at 4 p. m. Want of orders is the cause of this change in the hours of labor.

J. Painter & Sons have started up 23 of their 68 puddling furnaces after an idleness of four weeks. The gas well of this firm is down 1145 feet.

After a suspension of nearly two months, nearly all of the departments of Shoenberger & Co.'s mill resumed operations on August 26. The puddling department will not start work for some time. The large hammer has not been put in operation yet.

A small strike took place at the Union Mill of Carnegie Bros. & Co., last week. The crew of the 12-inch mill objected to some requirements of the manager and were discharged. There is every indication that the trouble will be bridged over.

VIRGINIA.

The Gem Furnace of the Shenandoah Iron Company, at Milnes, having been thoroughly overhauled and repaired, is now making over 100 tons of iron a day.

The Beechenbrook Foundry and Machine Works is a new industrial enterprise that Jolliffe & Estill have recently put in operation near Lexington, using water-power. This company will manufacture engines, boilers, castings of all kinds, machinery, &c.

OHIO.

The sale of the Steubenville Furnace has been set aside by the payment of the judgment (contract, cost and fees) obtained by J. G. Johnston, one of the bondholders of the Steubenville Furnace and Iron Company.

Regarding the cessation of the flow of gas in the well of the Jefferson Iron Works, Steubenville, General Negley, gas inspector of Pittsburgh, says: "I don't think that the stoppage will amount to anything serious. In all gas wells there is more or less shale or clay. This becomes detached, and if the flow of gas is not strong enough to force it out, the pipe becomes clogged, and the result is the gas ceases to flow for the time being. I don't think there is any danger that the gas has run out at the Jefferson well, or that it will run out for some time to come. Any well is liable to be temporarily stopped by shale at almost any time. Generally, enough gas accumulates in a short time to force it out. If not, the drill has to be started again to clean the pipe."

The Cleveland Rolling Mill Company's Bessemer steel works, rail and blooming mills suspended operation August 25 until further notice. The new blooming mill is now running steadily. A large warehouse is to be erected on the site of the smelting furnace now being torn down.

A rumor, not yet confirmed, is to the effect that a number of gentlemen from Pittsburgh have been making overtures for the purchase of the stock of the Forest City Rolling Mill Company.—*Iron Trade Review.*

The mill of the Reeves Iron Company, at Canal Dover, is running double turn and putting in full time.

ILLINOIS.

A hammer is now being placed in the new steam forge works of M. J. Smith, formerly of Smith & O'Leary, of Chicago. These works are 75 x 100 feet in size, and are thoroughly equipped. A second steam hammer of 2000 pounds weight is being built for this plant by the Hercules Iron Works.

The Union Foundry and Pullman Car Wheel Works have been running to their full capacity in their foundry department for the past three months and have melted an average of 146 tons of iron per day. Two new buildings have been erected to accommodate a number of tools added to the equipment, consisting of lathes, planers, &c. The company are finishing up a large quantity of architectural ironwork for a number of structures going up in Chicago, and have begun work on that for the Texas State House, at Austin, Texas, for which the contract has been secured.

MICHIGAN.

The Ottawa Iron Works, at Ferrysburg, owned by T. W. Ferry and Andrew Thompson, and appraised 15 months ago at $98,000, were sold recently under a mortgage and bid in by the holder of it, Alexander Wheldon, for $10,000.

The Phœnix Iron Works have bought 40 acres of land in Port Huron, on which to erect new buildings.

GEORGIA.

Kehoe's Iron Works, Wm. Kehoe & Co. proprietors, of Savannah, are working up to their full capacity. Their sugar mills and pans are used by sugar mills in various parts of the United States and in Mexico. They make all the work in their line required by the Plant system of railroads in Georgia and Florida.

The Novelty Iron Works, John Rourke, proprietor, of Savannah, are working full time and extending trade throughout the cotton belt and Florida.

J. W. Tynaw, engineer and machinist, of Savannah, whose works were burnt last year, has rebuilt them, with enlarged capacity. He makes a specialty of machinery and boilers for ships, &c.

MISSOURI.

The Helmbacher Forge and Rolling Mill Company, of St Louis, now have four hammers at work and report trade as somewhat improved.

The St. Louis Steam Forge, A. McDonald & Bro., proprietors, are running two of their hammers double turn.

A correspondent at Quincy, Ill., writes us as follows concerning the McKinney Tubular Rail Company's works at La Grange, Mo.: "I notice an item about the McKinney Tubular Rail Company putting in a battery of Thompson's steam boilers. They have never used them, and consequently are not in a position to pass an opinion. They have never made a rail, and have been attached and sued for labor and material furnished to repair a mill upon which they only have a quit-claim deed, and there is a suit now in progress to determine the ownership of the property. The writer is personally acquainted with the facts."

TEXAS.

An Associated Press telegram says that the Marshall Car Wheel and Foundry Works, at Marshall, were destroyed by fire on the 30th ult. The loss is estimated at $100,000; insurance, $22,000. Two hundred men are thrown out of employment, but the works will be at once rebuilt.

The foundry of Garrity & Co., which was to have been located at Temple, will locate at Belton.

TENNESSEE.

The Southern Machinery Company, of Shelbysville, have purchased ground for the erection of machine shops and foundry.

Wholesale Hardware Prices, September 3, 1884.

HARDWARE.

Anvils.
Eagle Anvils American.... ⅌ ℔ 10¢—dis 20 %
Wright's.... 10¾¢
Armitage's Mouse Hole.... 9¼¢ @ 9¾¢
Armitage Mouse Hole, Extra.... 11½¢
Trenton.... 9¾¢
Wilkinson's.... 10½¢
J. & Riley Carr, Patent Solid.... 11 @ 11½¢

Anvil Vise and Drill
Millers Falls Co., $18.00.... dis 20 %
Cheney Anvil and Vise.... dis 25 %

Apple Parers.
Advance.... ⅌ doz $5.75
Champion.... ⅌ doz $8.25
Gem.... ⅌ doz $5.25
Gold Medal.... ⅌ doz $5.00—dis 10 %
Jersey.... ⅌ doz $7.50—dis 25 %
Little Star.... ⅌ doz $5.50
New Lightning.... ⅌ doz $7.00
Oriole.... ⅌ doz $7.50—dis 30 %
Penn.... ⅌ doz $5.50
Rocking Table.... ⅌ doz $7.00
Triumph.... ⅌ doz 5.50
Turntable, Original.... ⅌ doz 6.00
Turntable, Improved.... ⅌ doz 7.00
Waverly.... ⅌ doz $5.00—dis 10 %
White Mountain.... ⅌ doz $5.50
"1872".... ⅌ doz $4.50
"1876".... ⅌ doz $5.75
"1878".... ⅌ doz $7.00

Augers and Bits.
First Quality.... dis 60@60&10 %
Cook's, Douglass Mfg. Co.... dis 40&10&10 %
Cook's, New Haven Copper Co.... dis 50&10 %
Patent Solid Head.... dis 30 %
Lewis' Patent Single Twist.... dis 45 %
Russell Jennings' Augers and Bits of all kinds, List of January 1, 1884.... dis 25 %
Imitation Jennings' Bits (old list).... dis 60 %
Ives' "Jennings'" Bits (old list).... dis 50&10 %
Car Bits, New Haven Copper Co.... dis 50&10 %
Snell Mfg. Co.'s Jennings' Bits (old list).... dis 50 %
Expansive Bits, Clark's small, $18; large, $26.... dis 25&10 %
Expansive Bits, Ives' No. 4, per doz., $60.... dis 25&10 %
Expansive Bits, Blake's.... $20—dis 40 %
Expansive Bits, Derby, $17 and $26.... dis 40&10 %
Expansive Bits, Ansonia.... dis 25 %
Hollow Augers, Ives' / Hollow Augers, French, Swift & Co. } dis 25 %
Hollow Augers, Douglass'.... dis 25 %
Hollow Augers, Bonney's Adjust, ⅌ dz. $48.... dis 40&10 %
Hollow Augers, Stearns' Adjust. ⅌ dz. $48—dis 20&10 %
Hollow Augers, Ives' Expansive, each $4.50—dis 40&10 %
Hollow Augers, Universal Expan., each, $4.50—dis 20 %
Wood's.... dis 25 %
Gimlet Bits.... $7.50 ⅌ gross, dis 50 %
Gimlet Bits, Diamond.... ⅌ doz. $1.10, dis 25&10 %
Gimlet Bits, "Bee".... dis 25 %
Double Cut Gimlet Bits, Shepardson's.... dis 45 %
Double Cut Gimlet Bits, Ct. Valley Mfg. Co.... dis 30&10 %
Double Cut Gimlet Bits, Hartwell's.... dis 60 %
Double Cut Gimlet Bits, Douglass'.... dis 40 %
Double Cut Gimlet Bits, Ives'.... dis 50 %
Holtz Bit Stock Drills.... dis 25&10 %
L'Hommedieu's Ship Augers.... dis 15 %
Watrous's Ship Augers.... dis 15 %
Snell's Ship Augers.... dis 15 %

Awl Hafts.
Sewing, Brass Ferrule.... $3.50 ⅌ gross—dis 40&10 %
Patent Sewing, Short.... $1.00 ⅌ doz—dis 40&10 %
Patent Sewing, Long.... $1.20 ⅌ doz.—net
Patent Peg, Plain Top.... $10.00 ⅌ gross—dis 40&10 %
Patent Peg, Leather Top.... $12.00 ⅌ gross—dis 40&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common.... ⅌ gross $1.70—dis 25&10 %
Awls, Shouldered Peg.... ⅌ gross $2.45—dis 25&10 %
Awls, Patent Peg.... ⅌ gross 63¢—dis 25&10 %
Awls, Shouldered Brad.... $2.70 ⅌ gross—dis 25&10 %
Awls, Handled Brad.... $7.50 ⅌ gross—dis 25&10 %
Awls, Handled Scratch.... $7.50 ⅌ gross—dis 25&10 %
Awls, Socket Scratch.... $1.50 ⅌ gross—dis 10&10 %
Brad Sets, Aiken's.... ⅌ doz. $10.00—dis 50&10 %
Millers Falls Adj. Tool Handles.... ⅌ doz $12—dis 25 %
Brad Sets, No. 42, $10.50; No. 43, $12.50.... dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50 / Brad Sets, Stanley's Excelsior, No. 2, $4.00 / Brad Sets, Stanley's Excelsior, No. 3, $5.50 } dis 25&10 %

Axes.—Best grades.
Regular.... per doz $6.75@$7.25
Double Steel, Bronzed.... add .75
Triple Steel, Bronzed.... add 1.00
Steel Pole, Bronzed.... add 1.00
Full Polished.... add .50
Beveled.... add .50

Double Bit Axes.
Regular, Bronzed.... per doz $12.00
Steel Pole, Bronzed.... add 1.00
Full Polished.... add 1.00
Beveled.... add 1.00

Axle Grease.
Frazer's, in bulk.... Keg ⅌ ℔, 5¢; Pail, ⅌ ℔, 6¢ net
Frazer's, in boxes.... ⅌ gross $10.00 net

Axles.
Common.... ⅌ ℔, 4¢
Fine Axles.... dis 50&10&5 %

Balances.
Spring Balances.... dis 40@40&10 %

Bells.
Hand, Light Brass.... dis 70&10@75&10 %
Hand, Extra Heavy.... dis 60@65 %
Hand, White Metal.... dis 70 %
Hand, Silver Chime.... dis 20&10 %
Hand, Globe (Cone's Patent).... dis 25&10 %
Gong, Abbe's.... dis 20&10&5 %
Gong, Yankee.... dis 30&10&5 %
Gong, Barton's.... dis 30&10&5 %
Crank, Taylor's.... dis 25&10 %
Crank, Brooks'.... dis 50&10&2 %
Crank, Cone's.... dis 10 %
Crank, Connell's.... dis 15&10 %
Lever, Sargent's.... dis 55&10 %
Lever, Taylor's Bronzed or Plated.... net
Lever, Taylor's Japanned.... dis 25&10 %
Lever, R. E. M. Co.'s.... dis 50&10&2 %
Lever, Reading.... dis 25&10&10 %
Pull, Brook's.... dis 50&10&2 %
Pull, Western.... dis 25&10 %
Call.... dis 25 %
Cow, Common Wrought.... dis 60&10 %
Cow, Western.... dis 20&10 %
Cow, Western, Sargent's new list.... dis 60&10&10 %
Cow, Kentucky "Star".... dis 20&10 %
Cow, Kentucky, Sargent's new list.... dis 60&10&10
Cow, Dodge, Genuine Kentucky, new list—

Nos.	0	1	1½	2	3	4	5	6	Hog	
	$12.00	10.00	9.00	8.00	7.00	5.00	3.50	2.50	5.00	dis 70 %

Cow, Texas Star.... dis 50 %

Bellows.
Blacksmiths' Common.... dis 50 %
Blacksmiths' Extra Pittsburgh Pattern.... dis 20 %
Molders'.... dis 25 %
Hand Bellows.... dis 20 %

Belting, Rubber.—Standard.... dis 70&5 %
Extra.... dis 60&10 %

Bench Stops.—Hotchkiss's.... ⅌ doz $5.00—dis 10 %
Weston's.... per doz No. 1, $10; No. 2, $9—dis 25&10 %
McGill's.... ⅌ doz $3—dis 10 %
Morrill's.... ⅌ doz $9—dis 50 %

Bit Holders.
Extension, Barber's.... ⅌ doz $15.00—dis 40&5 %
Extension, Ives'.... ⅌ doz $20.00—dis 40 %
Diagonal.... ⅌ doz $24.00—dis 40 %
Angular.... ⅌ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic.... ⅌ per doz $3.00—dis 30 %
Excelsior.... ⅌ doz $16.00—dis 50&10&2 %

Blind Fasteners.
Mackrell's.... ⅌ doz pairs, $1.00—dis 20&10 %
Van Sand's Screw Pattern.... $9 ⅌ gro.—dis 10&2 %
Van Sand's Old Pattern.... $9 ⅌ gro.—dis 10&2 %
Washburn's Old Pattern.... $9 ⅌ gro. net
Merriman's.... new list, net
Salisbury & Austin No. 2008.... $9 ⅌ gro. net
Security Gravity.... $9 ⅌ gro. net

Blind Staples.
Barbed, ½ in. and larger.... ⅌ ℔ 9¾¢ net
Barbed, ⅜ in.... ⅌ ℔ 11½¢ net

Blocks
Tackle Blocks, &c.... dis 40@40&10 %
Reed Mfg. Co. Self-Lubricating.... dis 50 %

Bolts
Cast Iron Barrel, Square, &c.... dis 60&10 %
Cast Iron Shutter Bolts.... dis 60&10 %
Cast Iron Chain (Sargent's list).... dis 60&10&10 %
Ives' Patent Door Bolts.... dis 55&10&10 %
Wrought Barrel.... dis 55&10 %
Wrought Square.... dis 55&10 %
Wrought Shutter, all Iron, Stanley's list.... dis 50&10 %
Wrought Shutter, Brass Knob, Stanley's list.... dis 25&10 %
Wrought Shutter, Sargent's list.... dis 55&10 %
Wrought Sunk Flush, Sargent's.... dis 60&10 %
Wrought Sunk Flush, Stanley's.... dis 40&10 %
Wrought B. K. Flush, Com'n Stanley's.... dis 55 %
Tire, Common, old list.... dis 85 %
Carriage, Common, list June 10, 1884.... dis 75 @ 75&5 %
Carriage, Philadelphia.... dis 70&10 %
Carriage, Philadelphia pattern.... dis 75 %
R. B. & W., Carriage, old list.... dis 70 %
Tire, American Screw Co.'s, Philadelphia, new list, July 2, 1883.... dis 75 %
Tire, "Bay State," new list, July 2, 1883.... dis 65 %
Tire, R. B. & W., 3-16 and ¼, Philadelphia list.... dis 80 %
Tire, R. B. & W., 5-16 and ⅜, Philadelphia list.... dis 70 %
Stove—American Screw Co.'s.... dis 60 %
Stove, R. B. & W.... dis 60 %
Stove, B. & E. Mfg. Co.... dis 57½ @ 60 %
Plow.... dis 55 %
Plow, R. B. & W.... dis 50 %
Machine.... dis 75 @ 75&5 %
Bolt Ends.... dis 75 @ 75&5 %

Borax.... 11½¢ @ 12¢ ⅌ ℔ net

Boring Machines.

	Upright.	Angular.	
First quality, no Augers	$5.50	$6.75	dis 50@50&5 %
Phillips, with Augers	7.00	7.50	net
Jennings & Co., no Augers	5.50	6.75	dis 45 %
Saunders' Pat., Reg. Bed	6.00	—	dis 20 %
Saunders Pat, Extra Bed	6.50	—	dis 20 %
Hubbard's	2.50	3.00	Net

Bow Pins
Humason, Beckley & Co.'s, Nos. 1 and 2.... dis 60 %
Humason, Beckley & Co.'s other Nos.... dis 70 %
Sargent & Co.'s.... $19.70 and $21.40, dis 60&10 %
Hotchkiss.... dis 30 %
Peck, Stow & W. Co.... dis 30&10 %

Braces.
Q. S. Backus.... dis 50&5 %
Barber's.... dis 40&5 %
Spofford's Patent.... dis 50&5 %
Ives' Patent Braces.... dis 55&10 %
Common Ball, American.... dis 55 %
Amidon's.... dis 50 %
Bartholomew's, Nos. 25, 27, 30.... dis 50 %
Bartholomew's, Nos. 117, 118, 119.... dis 60 %
Barker's Imp'd.... dis 55 %
Amidon's Corner Brace.... dis 30&10 %
Universal.... dis 55 %
Empire.... dis 30 %
Buffalo Ball.... dis 40 %

Brackets.
Shelf, plain.... dis 50&10&10 %
Shelf, fancy.... dis 60&10 %
Reading, plain.... dis 55&5&10 %
Reading, Rosette.... dis 60&5&10 %

Bright Wire Goods.
List of June 25, 1883.... dis 75&10 %

Broilers.—Henis' Self-Basting.

Inch	9	10	9 x 11
Per doz	$4.50	5.50	6.50

Bull Rings.
Union Nut Co.... dis 55 %
Sargent's.... dis 60&10 %
Hotchkiss' low list.... dis 30 %
Humason, Beckley & Co.'s.... dis 70 %
Peck, Stow & W. Co.'s.... dis 33⅓&10 %

Butts
Wrought Brass.... dis 80 %
Cast Brass, Tiebout's.... dis 40 %
Cast Brass, Corbin's Fast Joint.... dis 20&10 %
Cast Brass, Loose Joint.... dis 10&10 %
Fast Joint, Narrow.... dis 40&10&10 %
Fast Joint, Broad.... dis 40&10&10 %
Loose Joint.... dis 60&10 %
Loose Joint, Japanned.... dis 60&10 %
Loose Joint, Japanned with Acorns.... dis 60&10 %
Parliament Butts.... dis 60&10 %
Mayer's Hinges.... dis 60&10 %
Loose Pin, Acorns.... dis 60&10 %
Loose Pin, Acorns, Japanned.... dis 60&10 %
Loose Pin, Acorns, Jap'd, Plated Tips.... dis 60&10 %

WROUGHT IRON.
Fast Joint, Narrow.... dis 55&10@55&10&10 %
Fast Joint, Lt. Narrow.... dis 55&10@55&10&10 %
Fast Joint, Broad.... dis 55&10@55&10&10 %
Loose Joint, Broad.... dis 60&2½@60&2½&10 %
Table Butts, Back Flaps, &c.... dis 55&10@55&10&10 %
Inside Blind, Regular.... dis 55&10@55&10&10 %
Inside Blind, Light.... dis 55&10@55&10&10 %
Loose Pin, Wrt.... dis 60&2½@60&2½&10 %
Loose Pin, Light.... dis 55&10@55&10&10 %
Bronzed Wrought Butts.... dis 40&5 %
Spring Hinges:
Geer's Spring and Blank Butts.... dis 30 %
Union Spiral Spring, Japanned.... dis 25 %
Union Spring Hinge Co.'s.... dis 25 %
American Spring Hinge Co.'s.... dis 30 %
Gem Spring Hinges.... dis 30 %
Barker's Double Acting.... dis 20&10 %
Union Mfg. Co.... dis 25 %
Bommer's.... dis 25 %
Buckman's.... dis 25 %
Empire.... dis 60 %
Acme.... dis 70 %
Climax.... dis 50&10 %
Blind Butts, Parker.... dis 70&2 %
Blind Butts, Palmer.... dis 50&10 %
Blind Butts, Seymour.... dis 70&2 %
Blind Butts, Lull & Porter.... dis 75&10 %
Blind Butts, Nicholson.... dis 45&10 %
Blind Butts, Huffer.... dis 50 %
Blind Butts, Clark's, Nos. 1, 3, 5.... dis 75&2 %
Blind Butts, Manhattan Hardware Co.... dis 75 %
Blind Butts, Sargent's, Nos. 1, 3.... dis 66⅔&10 %
Blind Butts, Sargent's, No. 12.... dis 70&10 %
Blind Butts, Reading's Gravity.... dis 66⅔&10 %
Blind Butts, Shepard's "Noiseless," Nos. 50, 60, 65, 45 and 55.... dis 70 %
Blind Butts, Shepard's "Gravity," Nos. 1, 3 and 5.... dis 70&10 %
North's Automatic Blind Fixtures, No. 2, for Wood, $9; No. 3, for Brick, $10.50.
Shepard's Lull & Porter Shutter Hinges.... dis 70&10 %
Shepard's Reversible Shutter Hinges.... dis 70&10 %
Clark's Improved Shutter Hinge, Nos. 0, 1, 1½, 2, 2½, 3.... dis 60&10 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co.... dis 25 %
Bradley's.... dis 25 %
Beatty's.... dis 33⅓ %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s.... dis 30&10 %

Calipers.... See Compasses

Can Openers.
Messenger's Comet.... ⅌ doz $3.00, dis 25 %
American.... ⅌ gross $3.00, dis 30 %
Duplex.... ⅌ doz 25¢, dis 15 @ 20 %
Lyman's.... ⅌ doz $3.75, dis 20 %
No. 4, French.... ⅌ doz $2.25, dis 55 %
No. 5, Iron handle.... ⅌ gross $6.00, dis 30 %
Eureka.... ⅌ doz $2.50, dis 10 %
Sardine Scissors.... ⅌ doz $7.00, dis 55 %
Star.... ⅌ doz $5.00, dis 25&5 %
Sprague, No. 1, $2; No. 2, $2.25; No. 3, $2.50.... dis 50&10 %
"World's Best," ⅌ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.... dis 50&10 %
Universal.... ⅌ doz $3.00, dis 35&5 %
Domestic.... ⅌ doz $2.50, dis 45 %
Champion.... ⅌ doz $2.00, dis 50 %

Caps—Percussion, ⅌ 1000.
Hicks & Goldmark's
F. L. Waterproof, 1-10's.... 50¢
E. B. Trimmed Edge, 1-10's.... 65¢
E. B. Ground Edge, Central Fire, 1-10's.... 70¢
Double Waterproof, 1-10's.... $1.40
Pistol Waterproof, 1-10's.... 75¢
Musket Waterproof, 1-10's.... 80¢ } dis 10&10 %
G. D. & S. B.... 33¢, dis 10 %
Eley's E. B.... 60¢ net
Eley's D. Waterproof, Central Fire.... $1.50
U. M. C., F. C. trimmed.... 50¢ / U. M. C., F. L. ground.... 70¢ } dis 15&10 %
U. M. C., Cen. fire ground.... 70¢ / U. M. C., Double W. Proof.... $1.40 } dis 10&5 %
Double Waterproof, in 1-10's.... $1.40 / Colt's Pistol, in 1-10's.... 75¢ } dis 10 %
Musket, in 1-10's.... 80¢, dis 33⅓ %

Cartridges.
Rim.... List of Jan. 1, 1884—dis 50&10@ — %
Central Fire.... " " " dis 33⅓@ — %

Cards.
Horse and Curry.... dis 10 %
Cotton.... New list, Aug., 1883, dis 10 %
Wool.... " " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished.... ⅌ doz $5.00, dis 30 %
Cast Iron, Steel Points.... ⅌ doz $2.00, dis 50&5 %
Socket.... ⅌ doz $2.50, dis 25 %
Bullard's.... dis 25 %

Carpet Sweepers.
Bissell No. 5.... ⅌ doz $17.00
Bissell No. 7 New Drop Pan.... ⅌ doz $19.00
Bissell No. 12 Hall Sweeper.... ⅌ doz $42.00
Mystic.... ⅌ doz $17.00
Cottage.... ⅌ doz $15.00
Garland.... ⅌ doz $19.00
Queen.... ⅌ doz $16.00
Queen, with band.... ⅌ doz $18.00
King.... ⅌ doz $30.00

Casters.
Bed / Plate / Shallow Socket / Deep Socket } dis 50 @ 55 %
Yale Casters, reduced list May, 1884.... dis 25&10 %
Martin's Patent (Phoenix).... dis 40&10 %
Payson's Anti-friction.... dis 50 %

Cattle Leaders.
Humason, Beckley & Co.'s.... dis 70&10 %
Sargent's.... dis 60&10 %
Hotchkiss.... dis 30 %
Peck, Stow & W. Co.... dis 33⅓&10 %

Chain.
Trace, 6½-10-2.... ⅌ pair 79¢ / Trace, 6½-10-3.... ⅌ pair 70¢ / Trace, 7-10-2.... ⅌ pair 86¢ } dis 45@45&5 %
German Halter Chain, list of June, 1884.... dis 55@55&5 %
German Coil, list of June, 1881.... dis 55@55&5 %

	3-16	¼	5-16	⅜	7-16	½
English Coil	$0.10	.08½	.07¼	.06¼	.06	.05¾
American Coil	$0.9½	.07	.06	.05¼	.05	.04¾

Covert Halter, Hitching and Breast.... dis 35&5 %
Meneely's Breast, Halter and Hitching.... dis 50&10 %
Oneida Halter Chain (old list).... dis 45 %
Galvanized Pump Chain.... ⅌ ℔ 7¢
Jack Chain, Iron.... dis 70 %
Jack Chain, Brass.... dis 65&10 %

Chalk.
White.... ⅌ gro 60¢ net
Red.... ⅌ gro 80¢ net
Blue.... ⅌ gro $1.00 net
White Crayons.... ⅌ gro 12½¢ net

Chalk Lines.—See Lines.

Chisels.
Socket Framing, Crossman.... dis 65&5 %
Socket Framing, Arlington Edge Tool Co. / Socket Framing, Witherby Tool Co. / Socket Framing and Firmer, Douglass / Socket Firmers, Arlington Edge Tool Co. / Socket Firmers, Witherby Tool Co. / Socket Corner } dis 70&10
Socket Framing and Firmer, Buck Bros.... dis 30 %
Socket Framing and Firmer, Curtiss.... dis 75 %
Socket Framing and Firmer, Merrill.... dis 65&10 %
Socket Firmer, Framing, &c., L. & I. J. White.... dis 20&5 %
Tanged Firmers.... dis 45 @ 45&5 %
Tanged Firmers, Butcher's.... $4.75 @ $5.00
Tanged Firmers, Spear & Jackson's.... $5.00 to £
Tanged Firmers, Buck Bros.... dis 30 %

Clamps.
Iron, Providence Tool Co.'s Wrought Iron.... dis 25 %
Iron, Adjustable, Gray's.... dis 20 %
Iron, Adjustable, Lambert's.... dis 20 %
Iron, Adjustable, Snow's.... dis 40&5 %
Iron, Adjustable, Hammer's.... dis 15 %
Iron, Adjustable, Stearns'.... dis 20&10 %
Iron, Cabinet, Sargent's.... dis 70&10 %
Iron, Carriage Makers', Sargent's.... dis 65&10&10 %
Iron, Eberhard Mfg. Co.... dis 40&5 %
Saw Clamps.... See Vises

Clips, Axle.
Norway or Best.... dis 60&10 %
Superior.... dis 70 %

Cockeyes.... dis 40@45 %

Cocks, Brass.
Racking.... dis 60 %
Globe.... dis 60 %
Plain Bibbs.... dis 60 %
Ale and Beer.... dis 55 %

Coffee Mills
Board and Box.... dis 50 %
Selsor's Patent.... $9.50, $10.50, dis 25 %
American, Enterprise Mfg. Co.... dis 20&10 %
The "Swift," Lane Bros.... dis 20&10 %
Webb's Patent.... dis 45 @ 50 %

Compasses, Dividers, &c
Compasses.... dis 60 %
Calipers.... dis 60 %
Dividers.... dis 60 %
Bemis & Call Co.'s Dividers.... dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers.... dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.... dis 50&5 %
Bemis & Call Co.'s Double.... dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).... dis 30 %
Excelsior.... dis 50 %
Cook's Extension.... dis 25 %
J. Stevens & Co.'s Calipers and Dividers.... dis 25&10 %

Coopers' Tools.
Bradley's.... dis 10 @ 20 %
Barton's.... dis 20 %
L. & I. J. White.... dis 20&5 %
Albertson Mfg. Co.... dis 25 %

Corkscrews.
Humason & Beckley Mfg. Co.... dis 33⅓ %
Clough's Patent.... dis 33⅓ %

Corn Knives and Cutters.
Bradley's.... dis 10 %
Wadsworth's.... dis 25 %

Crow Bars.
Cast Steel.... ⅌ ℔ 5¼¢
Iron, Steel Points.... ⅌ ℔ 4¼ @ 4½¢

Curry Combs.
Fitch's.... dis 50&10 %
Hotchkiss, Novelty, new list, July, 1880.... dis 33⅓ %
Hotchkiss, Excelsior Supr. Champion.... dis 33⅓ %
Rubber.... ⅌ doz $10.00, dis 25 %

Curtain Pins.
Silvered Glass.... net
White Enamel.... net

Cutlery.
American Pocket.... Net prices
American Table.... Net prices
Wostenholme.... $8.00 to £

Dividers.... See Compasses

Dog Collars.
Embossed Gilt.... dis 30&10 %
Leather.... dis 40 %
Brass.... dis 40 %

Door Springs.
Torrey's Rod, regular size.... ⅌ doz $3, dis 50 %
Gray's.... ⅌ gro, $20.00, dis 20 %
Bee Rod.... ⅌ gro, $20.00, dis 20 %
Warner's No. 1, ⅌ doz. $2.60; No. 2, ⅌ doz. $3.30 dis 40 %
Gem (Coil):
No. 1, Large Japanned.... ⅌ doz $4.00 / No. 2, Medium, Japanned.... ⅌ doz 2.75 / No. 3, Small, Japanned.... ⅌ doz 2.00 } dis 50&10 %
Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 4, ("Shoo Fly") Screen Door size, ⅌ doz $1.50 / No. 5, Screen Door size.... ⅌ doz 2.00 / No. 6, Medium.... ⅌ doz 2.75 / No. 7, Large.... ⅌ doz 4.00 } dis 60 %
Victor (Coil).... dis 50&10&10 %
Champion (Coil).... dis 50&10 %
Philadelphia.... 5 in., $5.00; 8 in., $7.75, dis 35 %
Cowell's.... No. 1, ⅌ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete.... ⅌ doz $2.25, dis 20&10 %
Hercules.... dis 50 %
Shaw Door Check and Spring.... dis 25 @ 30 @ 35 %

Drawing Knives.
Douglass, Witherby, Arlington, &c.... dis 70&10 %
Crossman's No. 1.... dis 65&5 %
Merrill.... dis 65&10 %
Watrous.... dis 20 %
L. & I. J. White.... dis 20 %
Bradley's.... dis 35 %
Adjustable Handle.... dis 20 %

Drills and Drill Stocks.
Blacksmiths'.... each, $2.50, dis 20 %
Blacksmiths' Self-Feeding.... each, $7.50, dis 20 %
Breast, P. S. & W.... dis 20&10 %
Breast, Hotchkiss'.... dis 20 %
Breast, Wilson's.... dis 25 %
Breast, Millers Falls.... each, $3.00 dis 25 %
Breast, Bartholomew's.... each, $2.50, dis 25&10 %
Ratchet, Merrill's.... dis 20 %
Ratchet, Ingersoll's.... dis 25 %
Ratchet, Whitney's.... dis 20&10 %
Ratchet, Weston's.... dis 20 %
Ratchet, Moore's Triple Action.... dis 25@30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.... dis 20&10 %
Wilson's Drill Stocks.... dis 10 %
Automatic Boring Tools.... each, $2.25, dis 20 %

Drill Chucks.
Morse's Beach Patent.... each, $8.00, dis 20 %
Morse's Adjustable.... each, $7.00, dis 20 %
Danbury.... each, $8.00, dis 30 %

Egg Beaters.
Dover.... ⅌ doz $2.50
Monroe's.... dis 50 %
National.... ⅌ doz $4.50, dis 33⅓ %
Standard.... ⅌ gro, $18.00, dis 25@25&5 %
Family (T. & S. Mfg. Co.).... ⅌ gro, $18.00, net
Acme.... ⅌ gro, $12.00, dis 25 %
Triumph (T. & S. Mfg. Co.).... ⅌ gro, $11.50, net

Emery.
Regular numbers.... ⅌ ℔ 8¢
Flour and F. F.... ⅌ ℔ 6½¢
For Emery Paper and Cloth, see Sand Paper.

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Brass.... dis 60&10 %

Escutcheons.
Door Lock.... Same discounts as Door Locks
Brass Thread.... dis 55 %
Wood.... dis 25 %

Faucets.
Fenn's.... dis 40 %
Bohren's Patent Rubber Ball.... dis 25 %
Fenn's Cork Stops.... dis 33⅓ %
Star.... dis 55&10 %
Frary's Patent Petroleum.... dis 35&5 @ 40 %
West's Patent Key.... dis 45 %
Anchor Lock.... dis 45 %
Metallic Key, Leather Lined.... dis 60 %
Cork Lined.... dis 70 %
J. Sommer's Best Block Tin Key.... dis 40&10 %
J. Sommer's Cork Lined, 1st quality.... dis 50 %
J. Sommer's Diamond Lock.... dis 40 %
Self-Measuring, Enterprise.... ⅌ doz $36.00—dis 20&10 %
Self-Measuring, Lane's.... ⅌ doz $36.00—dis 20&10 %
Self-Measuring, Victor.... ⅌ doz $36.00—dis 25&10 %

Felloe Plates.... ⅌ ℔ 10¢, dis 30 %

Files.
J. & Riley Carr.... New list, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps.... dis 10 %
Butchers'....
Moss & Gamble.... New list, dis 15 %
Files of domestic make.... dis 50 & 10 @ — %
Heller's Horse Rasps.... dis 30&10 %
Stubs.... dis 25 @ 30 %

Fluting Machines.
Knox, 4½-inch Rolls.... $3.50 each / Knox, 6-inch Rolls.... $4.00 each } dis 35 %
Eagle, 3½-inch Roll.... $2.15, dis 35 %
Eagle, 5½-inch Roll.... 2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel.... 6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter.... $1.50 each, net
Geneva Hand Fluter, White Metal.. ⅌ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10.00, ⅌ doz.... dis 30 %
Shepard Hand Fluter, No. 85.... ⅌ doz $15, dis 40 %
Shepard Hand Fluter, No. 110.... ⅌ doz $8.75, dis 30 %
Shepard Hand Fluter, No. 95.... ⅌ doz $6.50, dis 20 %
Clark's Hand Fluter.... ⅌ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron.... ⅌ doz $15.00, dis 30 %
Buffalo.... ⅌ doz $10.00, dis 10 %

Fluting Scissors.... dis 45 %

Fly Traps.
Paragon.... ⅌ doz $3, net

Forks.
Hay, Manure and Spading.... dis 50 %
Plated, A 1, Rogers & Bro.... dis 50&5 %
Plated, Holmes, Booth & Hayden's.... dis 50&10 %

Fruit and Jelly Presses.
Enterprise Mfg. Co.... dis 20&10 %

Fry Pans.
Burnished list as follows.... dis 60&10&10

No.	0	1	2	3	4	5	6	7	8
⅌ doz.	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

"Acme".... dis 50 @ 55 %

Gauges.
Marking, Stanley's.... dis 55&10 %
Marking, Chapin's.... dis 55&10 %
Wire.... dis 10&10 %
Wire, Wheeler, Madden & Co.... dis 10 %

Gimlets.
Nail and Spike.... dis 50&10 %
"Eureka" Gimlets.... dis 40&10 %
"Diamond" Gimlets.... dis 40&10 %
Double Cut, Shepardson's.... dis 40 %
Double Cut, Ives'.... dis 45&10 %
Double Cut, Douglass'.... dis 40 %
"Bee".... ⅌ gross $12, dis 25 %

Glue Pots.
Tinned and Enameled.... dis 35@35&5 %
Family, Howe's "Eureka".... dis 40 %
Family, L. F. & C.'s "Handy".... dis 40 %

Grindstone Fixtures.
Sargent's Patent.... dis 70&10 %
Reading Hardware Co.... dis 30&10 %

Gun Wads.
U. M. C. B. E., 11 up.... $2.00
U. M. C. B. E., 9&10.... 2.30
U. M. C. B. E., 7&8.... 2.60
U. M. C. P. E., 11 up.... 3.10
U. M. C. P. E., 9&10.... 4.00
U. M. C. P. E., 7&8.... 4.90
Eley's B. E.... 2.00
Eley's P. E.... 3.00 } dis 5&5 %

Hack Saws.
Griffin's Hack Saws, complete.... dis 40&10 %
Griffin's Hack Saw, Blades only.... dis 20&10 %
Star Hack Saws and Blades.... dis 25 %

Halters.
Covert's Pat. Rope.... dis 50&5 %
Covert's Hemp Horse and Cattle Ties.... dis 50 %
Covert's Jute Horse and Cattle Ties.... dis 50&10 %
Meneely's Pat. Rope and Web.... dis 40&10 %
Meneely's Horse and Cattle Ties.... dis 40&10 %

Hammers.
Maydole's.... dis 15&5 %
Cheney's, new list, March, 1883.... dis 20&10 %
Hartford Hammer Co.'s Nail Hammers.. dis 25@25&5 %
Kip's.... dis 35 %
C. Hammond & Son.... dis 40&5 %
Humason & Beckley.... dis 15 %
Verree.... dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75. dis 25&10 %
Nelson Tool Works.... dis 40&10 %
Warner & Nobles.... dis 10 %
Yerkes & Plumb.... dis 30 %
Wilkinson's Smiths'.... 11½¢ ⅌ ℔ net
Heavy Hammers and Sledges.... dis 50&10 @ 60 %

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ⅌ doz.. dis 10 %
Providence Tool Co., Leg Irons, $25.00 ⅌ doz.... dis 10 %
Tower's.... dis 25 %

Handles.—Door or Thumb Latches.

Nos.	0	1	2	3	4	
Per doz	$0.90	1.00	1.18	1.35	1.50	dis 60&10 %

Roggin's Latches.... ⅌ doz. 35¢ @ 40¢ net
Bronze Iron Drop Latches.... ⅌ doz. 70¢ @ 80¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.... net
Barn Door.... ⅌ doz. $1.40, dis 10&10 %
Wrought Chest.... dis 70 %
Surface Chest.... dis 60&10 %
Flush Chest.... dis 70 %
Lifting.... dis 60&10 %
Saw and Plane.... dis 40&10 %
Boynton's Loop Saw Handles.... 50¢, dis 50 %
Boynton's Centennial Saw Handles.... 30¢, dis 25 %
Hammer and Hatchet.... dis 20 %
Brad Awl.... ⅌ gross $2.50, dis 10 %
Hickory Firmer Chisel, assorted.... ⅌ gross $4.50
Hickory Firmer Chisel, large.... ⅌ gross 5.00
Apple Firmer Chisel, assorted.... ⅌ gross 5.00
Apple Firmer Chisel, large.... ⅌ gross 6.00
Socket Firmer Chisel, assorted.... ⅌ gross 3.00
Socket Framing Chisel, assorted.... ⅌ gross 5.00 } dis 40 %
File, assorted.... ⅌ gross 2.75 / Auger, assorted.... ⅌ gross 5.00 / Auger, large.... ⅌ gross 7.00 } dis 25&10 %
Patent Auger, Ives'.... dis 25 %
Patent Auger, Douglass'.... ⅌ set $1.25 net
Patent Auger, Swan's.... ⅌ set $1.00 net

Hangers.
Barn Door, old patterns.... dis 60&10 %
Barn Door, New England.... dis 60&10&10 %
Climax (Anti-Friction).... dis 55 %
Zenith Anti-Friction Wood Track.... dis 55 %
Reed's Steel Arm.... dis 40 %
Challenge.... dis 50 %
"Champion" Medina Mfg Co.... $15.00, dis 50&10 %
Sterling Improved (Anti-Friction).... dis 65&10 %
Double Cut, Hartwell's.... dis 40&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18.... dis 33⅓ %
Cheritree.... dis 50 %
Kidder's.... dis 50&10 %
U. S.... 4 in., $12; 5 in., $15, dis 60 %
The "Boss".... dis 50&10 %
Terry's Patent.... 5 in., $12; 3½ in., $10, dis 40 %
Cronk.... No. 4, $12; No. 5, $14.40; No. 6, $18, dis 50&5 %
Architect.... ⅌ set $6.00, dis 20 %
Eclipse.... dis 20&10
Felix.... ⅌ set $4.50, dis 20 %
Hamilton Wrought.... dis 50 %

Harness Snaps.
Anchor (T. & S. Mfg Co.).... dis 65 %
Henshaw's, list of 1½ changed to $14.00.... dis 65 %
Judd's, list of 1½ changed to $14.00.... dis 65 %
Fitch's (Bristol), list of 1½ changed to $14.00.... dis 65 %
Hotchkiss.... dis 10 %
Andrews'.... dis 50 %
Sargent's Patent Guarded.... dis 70&10&10 %
German, old list.... dis 75 %
German, Sargent's new list.... dis 60&10 %
Covert.... dis 50 %
Covert, New Patent, new list.... dis 35 %
Covered Spring, new list, Oct., 1882.... dis 60&10 %
Meneely's Pat. Safety (Old German list).... dis 50 %
Meneely's Imp. German (Old German list).. dis 60&10 %

Hatchets.
Isaiah Blood.... dis 35 @ 35&5 %

	Nos.						
Shingling,	Nos. 1 2 3	⅌ doz	$7.25	$8.00	$8.75	
Claw,	Nos. 1 2 3	⅌ doz	7.75	8.50	9.25	
Lathing,	Nos. 1 2 3	⅌ doz	7.50	8.00	8.50	

Hunt's.... 35 %

Shingling,	Nos. 1 2 3	⅌ doz	$7.25	$8.00	$8.75
Claw,	Nos. 1 2 3	⅌ doz	7.75	8.50	9.25
Lathing,	Nos. 1 2 3	⅌ doz	7.50	8.25	9.00

Hurd's.... dis 35 @ 35&5 %

Shingling,	Nos. 1 2 3	⅌ doz	$8.00	$8.50	$9.00
Claw,	Nos. 1 2 3	⅌ doz	9.00	9.50	10.00
Lathing,	Nos. 1 2 3	⅌ doz	8.00	8.50	9.00

Yerkes & Plumb.... dis 35 @ 35&5 %

Shingling,	Nos. 1 2 3	⅌ doz	$7.50	$8.00	$8.50
Claw,	Nos. 1 2 3	⅌ doz	8.25	8.75	9.25
Lathing,	Nos. 1 2 3	⅌ doz	7.50	8.00	8.50

Underhill Edge Tool Co.... 35 @ 37½ %

Shingling,	Nos. 1 2 3	⅌ doz	$7.25	$8.00	$8.75
Claw,	Nos. 1 2 3	⅌ doz	7.75	8.50	9.25
Lathing,	Nos. 1 2 3	⅌ doz	7.50	8.25	9.00

Lathing, Solid Steel.... dis 30 %
No. 1, $11 Boston Pattern, $14.
C. Hammond & Son.... dis 45 @ 45&5 %

Shingling,	Nos. 1 2 3	⅌ doz	$8.00	$8.50	$9.00
Lathing,	Nos. 1 2 3	⅌ doz	8.00	8.50	9.99
Claw,	Nos. 1 2 3	⅌ doz	8.50	9.00	9.50
Broad,	Nos. 1 2 3	⅌ doz	11.00	13.50	16.00

Simmons.... dis 30 @ 35 %

Shingling,	Nos. 0 1 2 3	⅌ doz	$7.50	$8.00	$8.50	$9.00
Claw,	Nos. 0 1 2 3	⅌ doz	....	8.50	9.00	9.50
Lathing,	Nos. 0 1 2 3	⅌ doz	....	8.00	8.50	9.00
Broad,	Nos. 1 2 3 4	⅌ doz	9.00	10.00	12.00	14.00
Broad,	Nos. 5 6 7 8	⅌ doz	16.00	18.00	20.00	22.00

Collins.... dis 10 %

Shingling,	Nos. 1 2 3	⅌ doz	$5.50	$6.00	$6.50
Claw,	Nos. 1 2 3	⅌ doz	6.00	6.50	7.00
Lathing,	Nos. 1 2 3	⅌ doz	5.50	6.00	6.50

Peck's Champion Blade.... dis 40 %

Shingling,	Nos. 1 2 3	⅌ doz	$8.00	$8.50	$9.00
Lathing,	Nos. 1 2 3	⅌ doz	8.00	8.50	9.00
Claw,	Nos. 1 2 3	⅌ doz	9.00	9.50	10.00
Half,	Nos. 1 2 3	⅌ doz	8.00	8.50	9.00
Broad,	Nos. 1 2 3	⅌ doz	10.00	11.00	13.00
Broad,	Nos. 4 5 6	⅌ doz	14.50	16.50	18.00
Ax Pattern,	Nos. 1 2 3	⅌ doz	10.00	11.00	12.00

Hay Knives.
"Lightning".... ⅌ doz $20, dis 10 %
Wadsworth's.... dis 35 @ 35&5 %
Heath Patent.... ⅌ doz $13.50 net

Hinges.
Gate, Western.... ⅌ doz $4.40, dis 55 %
Gate, N. E.... ⅌ doz $7.00, dis 55 %
Gate, N. E. Reversible.... ⅌ doz $5.20, dis 55 %
Gate, Clark's, Nos. 1 2 3.... dis 60&10&2 %
Gate, N. Y. State.... ⅌ doz $5.00, dis 55 %
Gate, Automatic.... ⅌ doz $12.50, dis 50 %
Gate, Common Sense.... ⅌ doz pair $4.50, dis 50 %
Gate, Seymour's.... dis 45&10 %
Gate, Shepard's.... Nos. 1, 2, 3, 10, 20 & 25, dis 50&10 %
Reed's Latch and Hinge.... ⅌ doz sets $12, dis 50 %
Rolled Blind Hinges.... dis 50&10 %
Rolled Plate.... dis 60&10 %
Rolled Raised.... dis 60&10 %
Plate Hinges "Providence" { 8, 10 & 12 in., $5.55, ⅌ 100 ℔ / over 12 in., $4.50 ⅌ 100 ℔ } ..dis 10 %
Screw Hook and Strap { 8, 10, 12 in., $6.75 ⅌ 100 ℔ / 14 to 36 in., $5.50 ⅌ 100 ℔ } ..dis 10 %
Heavy Welded Hook { 8 to 12 in., $7.50 ⅌ 100 ℔ / 14 in. & up, $6.50 ℔ 100 ℔ } ...net
Screw Hook and Eye { ½ in.... ⅌ doz $1.50 / ⅝ in.... ⅌ doz $2.45 / ¾ in.... ⅌ doz $3.80 } dis 10 %
Wrought Strap and T.... dis 60&10&10&2@70 %

Hoes.
Riveted Shank.... dis
Socket.... dis
Planters'.... dis 50 @ 50&10 %
Scovill Pattern.... dis 60&5 %
Handled Planters'.... dis 60&5 %
Magic.... ⅌ doz $5 net
Grub.... ⅌ doz $10.50 @ $12.00, dis 55 @ 55&5 %

Hoisting Apparatus.
"Moore's" Hand Hoist, with Lock Brake.... dis 15 %
"Moore's" Differential Pulley Block.... dis 20 %

Hollow-Ware.
Stove Hollow-Ware, Ground.... dis 60 %
Enameled and Tinned Hollow-Ware—
Kettles.... dis 50&10 @ 50&10&5 %
Oval Boilers, Saucepans and Glue Pots.... dis 40 %
Gray Enameled Ware.... dis 45 %
Rustless Hollow-Ware.... dis 50&5 %
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Hooks.
Bird Cage, Sargent's list.... dis 60&10 %
Bird Cage, Reading.... dis 40&10 %
Cotton.... ⅌ doz $4.00, dis 50 %
Cotton Patented (N. Y. Mallet & Handle W'ks), dis 30 %
Cotton (Humason & Beckley Mfg. Co.).... dis 50 %
Belt.... dis 80 %
Bench Hooks.... See Bench Stops
Clothes Line, Sargent's list.... dis 65&10 %
Clothes Line, Reading list.... dis 45&5&10 %
Ceiling, Sargent's list.... dis 60&10&10 %
Harness, Reading list.... dis 40&10&10 %
Coat and Hat, Sargent's list.... dis 60&10&10 %
Coat and Hat, Reading.... dis 40&10&10 %
Wire Coat and Hat, Gem.... dis 45 %
Wire Coat and Hat, Miles'.... dis 70 %
Picture Hooks, Brown's Pat. Solid Brass, $4.00 ⅌ gross.... dis 25 %
Tassel and Picture (T. & S. Mfg. Co.).... dis 50 %
Wrought Staples and Hooks & Staples.... dis 70&7½&10 %
Wrought Staples, Stanley's list.... dis 70&7½&10 %
Wire Screw Hooks and Screw Eyes.... dis 75&10 %
Grass and Bush.... dis 55 %
Whiffletree—Patent.... dis 40&10 @ 50 %
Hooks and Eyes—Malleable Iron.... dis 60&10 %
Hooks and Eyes—Brass.... dis 60&10 %

Horse Nails.

		Nos. 5	6	7	8	9	10	
Ausable	⅌ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
Clinton, Pl'n.	⅌ ℔		23¢	21¢	20¢	19¢	18¢	dis 25&10 %
Clinton, Fin.	⅌ ℔		24¢	22¢	21¢	20¢	19¢	dis 25&10 %
Essex	⅌ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 33⅓ %
Putnam	⅌ ℔	27¢	24¢	22¢	21¢	20¢	19¢	dis 5&7 %
Vulcan	⅌ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 15 %
Northwest'n	⅌ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&5 %
Globe	⅌ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 10&5 %
A. C.	⅌ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10&5 %
C. B.-K.	⅌ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&5 %
Champlain	⅌ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 33⅓ %
New Haven	⅌ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 33⅓ %
Bridgewater	⅌ ℔	24¢	21¢	19¢	18¢	17¢	16¢	dis 30 %
Saranac	⅌ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 20 %
Champion	⅌ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&5 %
Capewell	⅌ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 33 %

Horse Shoes.
Burden.... ⅌ keg $3.75 @ 3.87½
R. I. Horse Shoe Co., Perkins' Imp. Light, Medium and Heavy.... ⅌ keg $3.75 @ 3.87½
Walker's Forged, Light, Med. or Heavy.... ⅌ keg $3.75 @ 3.87½
Mule Shoes.... ⅌ keg $4.75 @ 4.87½

Ice Awls, Chisels, &c.
American Ice Chisel Pol'd.... ⅌ doz $3.00, dis 15 %
National Ice Chisel.... ⅌ doz $6.25, dis 20 %
Novelty Ice Breakers.... ⅌ doz $6.25, dis 20 %
White's Sliding Head Picks.... ⅌ doz $2.50, dis 40 %
Dunlap's Ring Picks.... ⅌ doz $2.00, dis 20 %
Wood Head Picks, Sargent's.... ⅌ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's.... ⅌ doz $1.25, dis 50&10 %
Ice Mallets, Pick in head.... ⅌ doz $1.75, dis 15 %
Ice Mallets, Pick in handle.... ⅌ doz $2.00, dis 15 %
Ice Axes, Small Cast or Malleable.. ⅌ doz $1.20, dis 10 %
Combination Ice Tools.... ⅌ doz $2.00 net

IceCream Freezers.
American, Cromn and Star.... dis 45 %
Gem.... dis 55 %

Ice Tongs.
Champion.... ⅌ doz $6.00, dis 25&10 %
Family.... ⅌ doz $2.75, dis 15 %

Kettles.
Brass, 7 to 17 inches inclusive.... ⅌ ℔ 28¢, dis 10 %
Brass larger than 17 inches.... ⅌ ℔ 32¢, dis 10 %
Enameled and Tea Kettles.... See Hollow-Ware

Kettle Ears.
Eberhard Mfg Co.... dis 33⅓ %

Knives.
Ames' Butcher Knives.... dis 20 %
Nichols' Butcher Knives.... dis 40&10 %
Ames' Shoe Knives.... dis 15 %
Ames' Bread Knives.... ⅌ doz $1.50, dis 15 %
Moran's Shoe and Bread Knives.... dis 20 %
Hay and Straw.... See Hay Knives
Table and Pocket.... See Cutlery

Knobs.
Carriage, Japanned.... ⅌ gross 80¢, dis 60&10 %
Base, Rubber Tip.... dis 70&10&5 %
Hemacite Door Knobs, new list.... dis 35&5 %
Door Mineral / Door Por. Jap'd / Door Por. Plated / Door Por. } Same discounts as Door Locks.
Furniture Plain.... 75¢ gross inch, dis 10 %
Furniture, Wood Screws.... dis 25&10 %
Picture, Judd's.... dis 60&10&10 %
Picture, Sargent's.... dis 60&10 %
Hemacite, Picture.... dis 35 %
Shutter, Porcelain.... dis 60&10 %

Ladles.
Melting, Sargent's.... dis 50&10 %
Melting, Reading.... dis 30&10 %
Melting, Monroe's Patent.... ⅌ doz $4.00, dis 40 %
Melting, P. S. & W.... dis 30&10 %
Eberhard Mfg. Co.... dis 33⅓ %

Lanterns.
Tubular, Standard No. 0, ⅌ doz.... $7.50
Tubular, Standard No. 1, ⅌ doz.... 9.00
Tubular, Lift Wire, No. 0, ⅌ doz.... 9.00
Tubular, Lift Wire, No. 1, ⅌ doz.... 10.50
Guards for Tubulars, add ⅌ doz.... .25
Tipping Tubular, ⅌ doz.... 8.00
Police, Small, $6.25; Med., $7.50; Large, $10.00, dis 10 %
Porter's Tin R. R., $10.... dis 20 %
Owl.... $9, dis 20 %

Lawn Mowers.... dis 30&5&3 @ — %

Lemon Squeezers.
Porcelain Lined.... ⅌ doz. $6.00, dis 35 %
Wood.... ⅌ doz. $3.00, dis 35 %
Eureka, Tinned.... ⅌ doz. $8.00, dis 10 %
Dunlap's Improved.... ⅌ doz. $3.75, dis 20 %
Sammis'.... No. 1, $5; 2, $9; 12, $18 ⅌ doz., dis 20&10 %
Townsend's Patent.... $6.00 ⅌ doz., dis 33⅓ %
Jennings' "Star".... $3.00 ⅌ doz. net
The "Boss".... ⅌ doz. $4.00, dis 10&10 %
Dean's Nos. 1, ⅌ doz. $15.00; 2, $8.00; 3, $5.50.... dis 55 %

Lines.
Linen Fish.... dis 25&10 %
Cotton Chalk.... dis 55 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ⅌ gross.... dis 20 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50.... Net
Masons' Colored Cotton.... dis 45 %
Wire Clothes, Galvanized.... each, 25¢@40¢ net

Locks, Padlocks, Cabinet Locks, &c.
Door Locks, Escutcheons, &c.... dis 60&2 @ 60&10&2 %
Reading Hardware Co. (rev. list Jan. 2, '84).. dis 60&10 %
Plate.... dis 33⅓&2 %
F. Many's "Extension Cylinder".... $10.50 ⅌ doz net
Barnes Mfg. Co.... dis 40 %
Yale Flat Key.... dis 40 %
Dietz Flat Key.... dis 30 %
Stoddard.... dis 30 %
Langstroth & Crane's:
Round Key Latches.... dis 40&10 %
Flat Key Latches.... dis 33⅓&10 %
Cabinet, Eagle / Cabinet, Gaylord / Cabinet, P. & F. Corbin } Changes made in list price of some numbers March 10, 1884, dis 45&2 % cash.
Cabinet, A. E. Deitz.... dis 30@40 %
Cabinet, Stoddard Lock Co.... dis 30 %
A. E. Deitz, Flat Key Drawer.... dis 30@40 %
Yale "Standard" Drawer and Desk.... 40&10 %
"Shepardson" or "U. S.".... dis 35 %
"Felter" or "American".... dis 40&10 %
Eagle Trunk.... dis 15&2 %

PADLOCKS.
Russell & Erwin / Mallory, Wheeler & Co. / Nimick & Brittan Mfg. Co. / Wm. Wilcox & Co. / Norwich Lock Co. } dis 45&2 % @ —
Yale Lock Mfg. Co.'s "Standard".... dis 40 %
Eagle.... dis 25&2 %
Romer's, Nos. 0 to 91.... dis 40 %
Romer's, Nos. 200 to 505.... dis 25 %
A. E. Dietz.... dis 35 %
"Star".... dis 15 %
Fraim & Bro. List of 1883-84.... dis 55&5 %
Barnes Mfg. Co.... dis 40 %
Nock's.... dis 30 %
Brown's Patent.... dis 25

Lustro.
Four-ounce bottles.... ⅌ doz. $1.75; ⅌ gro. $17.00 net

Mallets.
Hickory.... dis 10&10 %
Lignumvitæ.... dis 10&10 %
Penfield Block Co., Lignumvitæ and Hickory.. dis 30 %

Meat Cutters.
Dixon's (P. S. W&.) Nos 1 2 3 4
⅌ doz.. $14.00 17.00 19.00 30.00—dis 40 %
Miles' Challenge.... Nos. 1 2 3
⅌ doz.. $22.00 30.00 40.00—dis 40 %
Perry's Nos. 1 2 3 4 4 g'rd 5 g'rd
Each.... $3.00 4.00 5.00 11.00 13.00 36.00—dis 25&5 %
Woodruff's (P. S. & W.).... Nos. 100 150
⅌ doz. $15.00 18.00—dis 40 %
Hales'.... Nos. 11 12 13
⅌ doz... $27.00 33.00 50.00—dis 60&10&2 %
Draw Cut.. Nos. 5 2 6 8 10
Each.. $50.00 75.00 80.00 225.00 400.00—dis 20 %
American.... dis 25 %
Nos.... 1 2 3 4 B
Each.... $5.00 7.00 10.00 25.00 50.00 60.00
Enterprise.... dis 25 %
Nos.... 10 12 22 2
Each.... $3.00 2.50 4.00 6.00 10.00
Kieser's No. 55.... $40 ⅌ doz, dis 40 %
Kieser's Gem.... $25 ⅌ doz, dis 40 %
Kieser's Monarch.... $45 ⅌ doz, dis 40 %
Kieser's Butcher.... $40 each, dis 20 %
Silver & Deming.... dis 25 %
Pennsylvania.... dis 40&10 %
Nos.... 1 2 3 00
⅌ doz.... $24.00 28.00 36.00 28.00
Beef Shavers (Enterprise Mfg. Co.).... dis 20&10 %

Mincing Knives.
Am. (2d quality), ⅌ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.... Net
Lothrop's.... dis 20&10 %
Smith's, ⅌ doz, Single, $2.00; Double, $3.... dis 40 %
Cowles Hdw. Co.... dis 55 %

Molasses Gates.
Stebbins' Patterns.... dis 70&10 %
Stebbins' Genuine.... dis 67½&10 %
Stebbins' Tinned Ends.... dis 40&10 %
Chase's Hard Metal.... dis 50&10 %
Bush's.... dis 20 %
Lincoln's Pattern.... dis 60&10 %
Weed's.... dis 15 %
Boss Nos.. 1 2 3 4
$7.00 8.00 9.00 10.00.. ⅌ doz, dis 60&10&10 %

Nails.... See Trade Report
Wire Nails.... dis. 35@40 %

Nail Puller.
Curtiss Hammer.... ⅌ doz $9.00 net
Giant, No. 1.... ⅌ doz $30.00 net

Nuts and Washers.
In lots less than 100 ℔, ⅌ ℔ add ½¢ to list; 1 ℔ boxes, 1¢ to list.
Square Nuts.... 9¢ off list
Hexagon.... 9½¢ off list
Washers.... 8½¢@9¢ off list

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).... dis 33⅓ %
Blake's Pattern.... ⅌ doz $2.00, dis 5 %
Turner & Seymour Mfg. Co.... dis 50 %

Oakum.—Dis on 100 bales and over, ⅛ % ⅌ ℔.
Best.... ⅌ ℔ 9 ¢
U. S. Navy.... ⅌ ℔ 8 ¢
Navy.... ⅌ ℔ 6¾¢

Oilers.
Zinc and Tin.... dis 60&10 %
Brass and Copper.... dis 50 %
Malleable (Hammer's), No 1, $3.25; No. 2, $3.60; No. 3, $4.00 ⅌ doz.... Net
Prior's Patent or "Paragon" Zinc dis 60&5 @ 60&10 %
Prior's Patent or "Paragon" Brass.... dis 50 %
Olmstead's Tin and Zinc.... dis 60 %
Olmstead's Brass and Copper.... dis 50 %
Broughton's Zinc.... dis 60 %
Broughton's Brass.... dis 50 %

Packing, Steam.
N. Y. Belting & Packing Co....dis 20 %

Peach Parers.
Rotary Knife....⅌ doz $15, dis 10 %
Diamond State....⅌ doz $15, dis 10 %

Pencils.
Faber's Carpenters'....high list, dis 50 %
Faber's Round Gilt....⅌ gro $5.25 net
Dixon's Lead....⅌ gro $4.50 net
Dixon's Lumber....⅌ gro $8.75 net
Dixon's Carpenters'....dis 40&10 %

Picks.
Railroad, 5 to 6, $11.00; 6 to 7, $12....dis 50&10 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13....dis 50&10 %

Picture Nails.
Brass Head, Sargent's list....dis 50&10 %
Brass Head, T. & S. Mfg. Co....dis 50 %
Porcelain Head, Sargent's list....dis 50&10 %
Porcelain Head, Judd's list....dis 33⅓ %
Porcelain Head, T. & S. Mfg. Co....dis 33⅓ %
Niles' Patent....dis 33⅓ %

Pinking Irons....⅌ doz 75¢ net

Planes and Plane Irons.
Bench, First Quality....dis 20 %
Bench, Second Quality....dis 25 %
Molding....dis 15 %
Bailey's (Stanley R. & L. Co.)....dis 20&10 %
The Stanley (S. R. & L. Co.)....dis 20&10 %
Bailey's "Victor"....dis 20&10 %
Plane Irons, Butcher's....$5.00 @ $5.25 to £
Plane Irons, Buck Bros....$5.00 to £
Plane Irons, Auburn Tool Co....dis 20&10 %
Plane Irons, The Globe Mfg. Co., "Baldwin Iron"....dis 20&10 %
L. & I. J. White....dis 20 %
Plane Irons, Ohio Tool Co....dis 20&10 %
Plane Irons, Sandusky Tool Co....dis 20&10 %

Pliers and Nippers.
Button's Patent....dis 33⅓ %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21 00 ⅌ doz....dis 20&10 %
Humason & Beckley Mfg. Co....dis 30&10 %
Gas Pliers....dis 55 %
Eureka Pliers and Nippers....dis 40 %
Russell's Parallel....dis 25 %
P. S. & W. Cast Steel....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %

Plumbs and Levels.
Disston's....dis 45&10 %
Stanley R. & L. Co.'s Pat. Adjustable....dis 65&10 %
Stanley R. & L. Co.' Non-Adjustable....dis 65&10 %
Chapin's Patent Adjustable....dis 65&10&10 %
Chapin's Non-Adjustable....dis 65&10&10 %
Standard Rule Co.'s New Adjustable....dis 65&10 %
Standard Rule Co.'s Non-Adjustable....dis 65&10 %
Johnson's Patent Adjustable....dis 65&10 %
Pocket Levels....dis 65&10 %
Davis' Inclinometers....dis 20 %

Post Hole and Tree Augers.
Samson Post Hole Digger....⅌ doz $36.00, dis 20&10 %
Fletcher Post Hole Augers....⅌ doz $36.00, dis 20 %
Eureka Diggers....⅌ doz $27
Leed's....each $2.50
Vaughan's Hollow Tube Post Hole—6 in., $23.60; 7, 8 and 9 in., $25.00 ⅌ doz, dis 20&10 %
Kohler's Little Giant....⅌ doz $27

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ⅌ doz $18.00....dis 20&10 %
Disston's Pruning Hook....⅌ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruner....dis 33⅓ %
Pruning Shears....⅌ doz $4.00 @ $4.50
Henry's Pruning Shears....⅌ doz $5.50 @ $5.75 net
Wheeler, M. & Co.'s Combination....⅌ doz $12, dis 20 %
Dunlap's Saw and Chisel....⅌ doz $9, dis 40 %

Pulleys.
Hot House and Tackle....dis 65&10 %
Japanned Screw....dis 65&10 %
Brass Screw....dis 70&10 %
Japanned Side....dis 65&10 %
Japanned Clothes Line....dis 60&10 %
Hay Fork, Solid Eye....$4.50; Swivel, $5.00, dis 50&10 %
Hay Fork, "Anti Friction"....$6.75, dis 10&10 %
Hay Fork, "F" Common and Pat. Bushed....dis 20 %
Hay Fork, Tarbox Pat. Iron....dis 20 %
Shade Rack....dis 45 %

Pumps.
Cistern....dis
Pitcher Spout....dis
Yard and Set Length....dis

Punches.
Saddlers' or Drive....⅌ doz $2.00; 2.25; 2.50....dis 55 %
Bemis & Call Co.'s Cast Steel Drive....dis 50&5 %
Bemis & Call Co.'s Springfield Socket....dis 50&5 %
Spring....⅌ doz $7.00, dis 55& 5 %
Spring, Leach's Patent....dis 15 %
Bemis & Call Co.'s Spring and Check....dis 40 %
Solid Tinners'....⅌ doz $1.44, dis 40&10 %

Rail.
Sliding Door, Wrought Brass....⅌ ℔ 35¢, dis 20 %
Sliding Door, Bronzed Wrt. Iron....⅌ foot 12¢, dis 35 %
Sliding Door Iron, Painted....⅌ foot 4¢, dis 20&10 %

Barn Door, Light....Inch.	¼	⅜	½	
Per 100 feet....	$2.50	3.00	4.40	—dis 10 %

R. D. for N. E. Hangers—

	Small.	Med.	Large.	
Per 100 feet....	$2.15	2.70	3.25	net

Terry's Wrought Iron, 5¢ ⅌ foot....net

Rakes.
Cast Steel....dis 60 %
Malleable....dis 60 %
Hay....dis 40 %

Razors.
J. R. Torrey Razor Co....dis 20 %
Wostenholme & Butcher....$10 to £, dis 10 %

Razor Strops.
Genuine Emerson....dis 45@50 %
Badger's (not Emerson)....dis 33⅓ %
Imitation Emerson....⅌ doz $2.00, dis 20&10 %
Torrey's....dis 20 %

Refrigerators.
G. N. Pierce & Co....dis 30 @ 33⅓ %
Challenge....dis 33⅓ %
Challenge Beer Coolers....dis 25 %

Rivets.
Black Iron and Tinned....dis 40 %
Iron in bulk....dis 40 %
Iron Carriage Rivets....dis 40 %
Tinned Iron Rivets and Burrs....dis 40 %
Copper Rivets and Burrs....dis 50 %

Nos.	7	8	9	10	11	12	13	14	15
⅌ ℔	.49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Rivet Sets....dis 40&10 %

Rods.—Stair, Brass....dis 25 %
Stair Black Walnut....60¢ ⅌ doz, dis 10 %

Rollers.—Barn Door, Sargent's list....dis 60&10&10 %
Acme (Anti-Friction)....dis 55 %

Rope.—Mnf's list, Aug. 7, 1884....dis 1¢ ⅌ ℔
Manila....½ inch and larger ⅌ ℔ 16 ¢
Manila....⅜ inch ⅌ ℔ 16½¢
Manila....¼ and 5-16 inch ⅌ ℔ 17 ¢
Manila Tarred Rope....⅌ ℔ 15½¢
Manila, Hay Rope....⅌ ℔ 16 ¢
Sisal....½ inch and larger ⅌ ℔ 9½¢
Sisal....⅜ inch ⅌ ℔ 10 ¢
Sisal....¼ and 5-16 inch ⅌ ℔ 10½¢
Sisal, Hay Rope....⅌ ℔ 9½¢

Rules.
Boxwood....dis 75&10 %
Standard....Ivory....dis 50 @ 50&10 %
Stanley....Ivory....dis 50&10 %
Stephens....Ivory....dis 55 %

Sad Irons.
From 4 to 10....⅌ 100 ℔ $2.70 @ $2.75
Self-Heating....⅌ doz. $9.00 net
Self-Heating, Tailors'....⅌ doz. $18.00 net
Gleason's Shield and Toilet....dis 25 %
Mrs. Pott's Irons, Double Pointed....dis 35 %
Mrs. Pott's Irons, Square Back....dis 35 %
Enterprise Star Irons, new list, July 20, 1882....dis 35 %
Combined Fluter and Sad Iron....⅌ doz. $15.00, dis 15 %
Chinese Laundry (N. E. Butt Co.)....8½¢, dis 15 %
New England....5¢, dis 15 %

Sand Paper and Emery Paper.
Baeder & Adamson's Flint, 00 to 1½....$4.50 ⅌ ream } dis 30&10@40 %
Baeder & Adamson's Flint, 2, 2½ & 3....5.00 ⅌ ream
Baeder & Adamson's Flint, assorted....4.75 ⅌ ream
Baeder & Adamson's Star....3.75 ⅌ ream
Baeder & Adamson's Emery....⅌ ream 6.50 @ 11.50
Bartles Best Flint, Nos. 00 to 1½....⅌ ream $4.50 } dis 40 %
Bartles Best Flint, assorted....⅌ ream 4.50
Bartles Best Flint, Nos. 2 to 3....⅌ ream 5.00
Bartles Best Flint, No. 3½....⅌ ream 5.50
Columbia Flint, all Nos....⅌ ream 4.00
Madison Mills Flint, all Nos....⅌ ream 3.50
Bartles Emery Paper....⅌ ream $6.50 @ 11.00 dis 30&10 %
Bartles Emery Cloth....⅌ ream 18.00@ 26.00 } dis 20 %
Crocus Cloth....⅌ ream 18.00@....
New England, same list as B. & A. Flint....dis 30&10 %
Gage's....dis 30&10 %

Sash Cord.
Common....⅌ ℔, 12½¢ @ 13¢ net
Patent....⅌ ℔, 15¢ @ 16¢ net
White Cotton Braided....28½¢ @ 31¢ ⅌ ℔ net
Common Russia Sash....⅌ ℔ 13¢
Patent " ...." 15¢
Cable Laid Italian " ...." 26¢
India Cable Laid " ...." 14¢
Silver Lake, A Quality, White....50¢. dis 10&10 %
Silver Lake, A Quality, Drab....55¢. dis 10&10 %
Silver Lake, B Quality, White....50¢. dis 10&10&5 %
Silver Lake, B Quality, Drab....55¢. dis 10&10&5 %
Silver Lake, C Quality, White (only)....34¢ net.
Spring Lake....50 @ 55¢. dis 10&10&5 %
Raw Hide, ⅌ foot, 1¼ in. 5¢; 5-16 in., 7¢; ⅜ in., 10¢....dis 15 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ⅌ gross....dis 33⅓ %
Ferguson's....dis 33⅓ %
Morris....dis 50 %
Broughton's Burglar Proof....dis 33⅓ %
Walker's....dis 10 %
Attwell Mfg. Co....dis 25@33⅓ %
Hammond's Window Springs....dis 25 %
Northup Window Springs, No. 1 $10.00 ⅌ gross....dis 15 %
"Common Sense," Japanned, Coppered and Bronzed....⅌ gross $5.00 net
"Common Sense," Nickel Plated....⅌ gross $12.00 net
"Universal"....dis 30 %
Kempshall's Gravity....dis 50 %
Kempshall's Model....dis 50&10 %
Corbin's Daisy....dis 50&10 %
Payson's Perfect....dis 50 %
Hugunin's "New" and "Improved Screw" Balances:
Malleable Iron, February, 1884, list....dis 33⅓ %
Gray Iron, February, 1884, list....dis 33⅓&15 %
Hugunin's Sash Locks, May, 1884, list....dis 33⅓ %
Stoddard "Practical"....dis 10 %

Sash Weights.
Solid Eyes, in 500 ℔ lots and over....⅌ ℔ 1½¢ net

Sausage Stuffers or Fillers.
Miles' "Challenge"....⅌ doz. $20, dis 40 %
Perry....⅌ doz. No. 15; No. 0, $21, dis 25&10 %
Draw Cut No. 4....each, $30.00, dis 20 %
Enterprise Mfg. Co....dis 25 %
Silver's....dis 25 %

Saws.
Disston's Circular, Mill and Cross Cut....dis 45&10 %
Disston's Hand, Panel, Rip, &c....dis 20&10 %
Boynton's Lightning Cross Cuts, new list....dis 40 %
Boynton's Circular and Mill....dis 40 %
Boynton's Ice....dis 25 %
Boynton's Lightning Hand, Panel and Rip....dis 25 %
Wheeler, Madden & Clemson Mfg. Co.'s Hand....dis 30 %
W. M. & C. Champion X Cuts, Regular....⅌ foot 29¢
W. M. & C. X Cuts, Thin Back....⅌ foot 32½¢
Livingston's Butcher and Kitchen....dis 20 %
Livingston's Framed Wood—

Nos....	101	102	103	104	105
Per doz....	$10.00	8.50	10.00	7.50	6.20 net

Simond's Circular....dis 35 %
Simond's Crescent-Ground Cross Cuts, patent December 26, 1882....dis 25 %
Peace Circular and Mill....dis 45&10 %
Peace Hand Panel and Rip....dis 20&10 %
Peace Cross Cuts, Standard....⅌ foot 26¾¢
Peace Cross Cuts, Thin Back....⅌ foot 29¾¢
Peace Band Saws, all widths....dis 20&10 %
Richardson's Circular....dis 40 %
Richardson's Mill....dis 40 %
Richardson's Cross-Cuts....⅌ foot 29¢
Richardson's Cross-Cuts, thin back....⅌ foot 32½¢
Richardson's Hand Panel, Butcher and Web Saws....dis 25 %
Barry's Circular....dis 45 %

Saw Frames.
White, Vermont....⅌ doz $1.50, dis 25&10 %
Red, Polished and Varnished....⅌ doz $1.50, dis 10 %
Saw Rods....$10 list dis 10&10 %

Saw Sets.
Boynton's Patent X Cut, ⅌ doz $12.00; Hand Saw, ⅌ doz $10.00....dis 25 %
Stillman's Genuine....⅌ doz $3.50 and $5.50, dis 10 %
Stillman's Imitation....⅌ doz $4.00, dis 60 %
Common Lever....⅌ doz $2.00, dis 30&10 %
Leach's....No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's....dis 20&10 %
Hammer, Hotchkiss....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer....dis 30&5 %
Bemis & Call Co.'s Plate....dis 10 %
Bemis & Call Co.'s Cross Cut....dis 12½ %
Aiken's Genuine....$13.00, dis 50&10 %
Aiken's Imitation....$8.00, dis 55 %
Hart's Patent Lever....dis 20 %
Disston's....dis 20&10 %
Morrill's....No. 1, $15.00; No. 5, $52.00, dis 40&5 %
Croissant (Keller)....No. 1, $15.00; No. 2, $24.00, dis 40 %

Scales.
Hatch, Counter, No. 171....⅌ doz $42.00, dis 40&10 %
Hatch, Tea, No. 161....⅌ doz $15.00, dis 40&10 %
Union Platform....$6.00, dis 55 %
Chatillon's Grocers....dis 40 %
Chatillon's Eureka....dis 25 %
Chatillon's Family Favorite....dis 30 %
Family Universal, ⅌ doz, 12 ℔, $30.00; 24 ℔, $36.00, net
Family, Turnbull's....dis 30 %
Scale Beams, List of January 12, 1882....dis 55 @ 60 %
Scale Beams, Custer....dis 25 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.) $6.50, dis 20&10 %
Box, 1 Handle....⅌ doz $4.00, dis 10 %
Box, 2 Handle....⅌ doz $6.00, dis 10 %
Defiance Box and Ship....dis 20&10 %
Foot....dis 50&10 %
Ship, Common....⅌ doz $3.50 net
Ship, Providence Tool Co....dis 10 %

Screen Corners.
Porter's Pat. Window and Door Frame....dis 33⅓ %

Screw Drivers.
Douglas Mfg Co....dis 20&10&10 %
Disston's....dis 40 %
Disston's Patent Excelsior....dis 45&10 %
Buck Bros....dis 27½ %
Stanley R. & L. Co.'s Varnished Handles....dis 60&10 %
Stanley R. & L. Co.'s Black Handles....dis 50&10 %
Sargent & Co.'s Nos. 1 & 20, Forged Blade....dis 66⅔&10 %
Sargent & Co.'s Nos. 20 & 30, Cast Steel....dis 55&10 %
Sargent & Co.'s No. 60, Round Blade....dis 60&10 %
Sets interchangeable....⅌ doz $18.00, dis 25 %
Champion....dis 25 %
Clark's Patent....dis 20&10 %
Crawford's Adjustable....dis 30 %

Screws.
Flat Head Iron....dis 75
Round Head Iron....dis 70 %
Flat Head Brass....dis 75 %
Round Head Brass....dis 65 %
Brass and Silver Capped....dis 40 %
Japanned, list of Plain Screws....dis 60&10 %
Lag or Coach....dis 75&5 %
Coach, Patent Gimlet Point....dis 75 %
Bed....dis 33⅓ %
Machine, Flat Head, Iron....dis 55 %
Machine, Round Head, Iron....dis 50 %
Bench, Iron....dis 55&10 %
Bench, Wood, Beech....⅌ doz $3.00, dis 10 %
Bench, Wood, Hickory....dis 20&10 %
Hand, Wood....dis 25&10 %
Hand Rail, Sargent's....dis 66⅔&10
Hand Rail, Humason, Beckley & Co.'s....dis 70 %
Hand Rail, Am. Screw Co....dis 70 %
Jack (Wilson's)....dis — %

Scroll Saws.
Lester, $10.00....dis 25 %
Rogers, $3.50....dis 25 %

Scythes....dis 25 %

Shears and Scissors.
American (Cast) Iron....dis 75 %
Pruning....See Pruning Hooks and Shears
Barnard's Lamp Trimmers....⅌ doz $3.75
Tinners'....add 6 %, dis 10 %
Seymour's, List, Dec., 1881....dis 60 %
Heinsch's, List, Dec., 1881....dis 60 %
Heinsch's Tailor's Shears....dis 33⅓ %
Mass. Cutlery Co. St. Trimmers....dis 75 %
Cast Steel Trimmers....dis 80 %
Wiss, J., & Sons' list, Dec., 1881....dis 60 %
Wiss, J., & Sons' Tailors' Shears....dis 50 %

Sheaves.
Sliding Door, M. W. & Co., list....dis 50&10&2 %
Sliding Door, R. & E., list....dis 60&10&2 %
Sliding Door, Patent Roller....dis 60&10&2 %
Sliding Door, Patent Roller, Hatfield's....dis 60&10&2 %
Sliding Door, Russell's Anti-Friction....dis 60&10&2 %
Sliding Door, Moore's Anti-Friction....dis 60 %
Sliding Shutter, R. & E. list....dis 50&10&2 %
Sliding Shutter, Sargent's list....dis 60&10 %
Sliding Shutter, Reading list....dis 60&10 %
Moore's Anti-Friction (Hanging)....New list, dis 25 %

Ship Tools.
L. & I. J. White....dis 20&5 %

Shovels and Spades.
Ames' Shovels, Spades and Scoops....dis 17½ %
Griffiths'....dis 50&10 %
Old Colony....dis 15 %
Groom Shovel Co....dis 20 %
Hussey, Binns & Co....dis 20 %
Lehigh Mfg. Co....dis 50&10 %
Payne Pettebone & Son, list Jan. 2, 1882....dis 50&5 %
R. T. Pettebone, Pat. Shovels, new list....dis 50 %
R. T. Pettebone, Pat. Scoops, new list....dis 20 %
Remington's (Lowman's Patent)....dis 30 %
Rowland's....dis 50&10 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list....dis 60&10&2 %
Iron and Brass Head, P. S. & W....dis 50&5&10 %
Polished Steel, new list....dis 50&10&2 %

Slates.
Square Frames, by case....dis %
Less than a case....dis %

Spoke Shaves.
Defiance Metallic....dis 20&10 %
Iron....dis 45 %
Wood....dis 30 %
Bailey's (Stanley R. & L. Co.), new list....dis 30&10 %
Stearns'....dis 30&10 %

Spoke Trimmers.
Bonney's....⅌ doz $10.00, dis 50 %
Stearns'....⅌ doz $9.00, dis 20&10 %
Ives'....No. 1, $15.00; No. 2, $12.00 ⅌ doz, dis 55&10 %
Douglass'....⅌ doz $9.00, dis 15 %

Spoons.
Basting....dis 70&5 %
Solid Table and Tea....dis 70 %
Britannia....dis 60&10 %
Meriden Brit. Co., Rogers....dis 50&5 %
Wm. Rogers Mfg. Co....dis 50&5&5 %
Holmes, Booth & Haydens....dis 50&10 %
Holmes & Edwards Silver Co....dis 50&10&5 %
German Silver....dis 40&5 %
Cast Steel, Silver Plated....dis 33⅓ %
Tin (P. S. & W.), Teas....$1.25 ⅌ gro net
Tin (P. S. & W.), Tables....$2.00 ⅌ gro net
Tin (Cowles Hdw. Co)....dis 10 %
Tin (Cowles Hdw. Co.), case lots....dis 20 %

Squares.
Steel and Iron....dis 50&10&2 % } Full cases,
Nickel Plated....dis 50&10&2 % } extra 10 %
Try Square and T Bevels....dis 55&10 %
Disston's Try Square and T Bevels....dis 40 %
Winterbottom's Try and Miter....dis 20&10 %

Stocks and Dies....dis 5&10 %
"Lightning" Screw Plate....dis 10 %

Stone.
Hindostan No. 1, 6¢; Ax, 8¢; Slips, 10¢....dis 40 %
Sand Stone....⅌ ℔, 5¢, dis 33⅓&10 %
Washita Stone....No. 1, ⅌ ℔, 15¢ net
Washita Stone....No. 2 ⅌ ℔, 11½¢ net
Washita Stone Slips....No. 1, ⅌ ℔, 39¢ net
Arkansas Stone, No. 1, 4 to 6 in....⅌ ℔, $1.35, dis 10 %
Arkansas Stone, No. 1, 6 to 9 in....⅌ ℔, $2.00, dis 10 %
Turkey Oil Stone (Chase)....4 to 8 in., ⅌ ℔, 60¢, dis 10 %
Turkey Slips (Chase)....$1.75 ⅌ ℔, dis 10 %
Lake Superior (Chase)....⅌ ℔, 16¢, dis 10 %
Lake Superior Slips (Chase)....⅌ ℔, 30¢, dis 10 %
Grindstones, Family, Loring's....dis 10 %

Stove Polish.
Joseph Dixon's....⅌ gro $6.00, dis 10 %
Gem....⅌ gro $4.50, dis 10 %
Gold Medal....⅌ gro $6.00, dis 25 %
"Mirror"....⅌ gro $6.00, dis — %
Lustro....⅌ gro $4.75 net
Ruby....⅌ gro $3.75 net
Rising Sun....⅌ gro $5.75 net
Dixon's Plumbago....⅌ ℔ 8¢ net
Boynton's Noon Day, ⅌ gro, No. 1, large, $5.50; No. 2 small, $3; No. 3, medium, $4.

Tacks, Brads, &c.
New List, Sept. 1, 1882.
Tinned Swedes Tacks....dis 30 %
Tinned American Tacks....dis 30 %
Swedes Tacks, all kinds....dis 30 %
American Cut Tacks....dis 30 %
Copper Tacks and Nails....dis 30 %
Swedes Hungarian Nails....dis 35 %
Gimp and Lace Tacks....dis 30 %
Gimp and Lace Tacks, Tinned....dis 30 %
Finishing Nails....dis 25 %
Trunk and Clout Nails....dis 25 %
Common and Patent Brads....dis 20 %
Basket Nails....dis 20 %
Brush Tacks....dis 20 %
Leathered Carpet Tacks....dis 20 %
Cigar Box Nails....dis 20 %
Chair Nails....dis 20 %
(Extra 10&2 % on all.)
Double-pointed Tacks....dis 70&10 %

Tap Borers.
Common and Ring....dis 20 %
Ives' Tap Borers....Nos. 1, 2, 4—dis 15&10 %
Ives' Tap Borers....Nos. 13, 14—dis 25&10 %
Enterprise Mfg. Co....dis 20&10 %
Clark's....dis 20&10 %

Tapes, Measuring.
American....dis 25&10 %
Spring....dis 40 %
Chesterman's....Regular list dis 20 @ 25 %

Thermometers.
Tin Case....dis 80 %

Transom Lifters.
Wollensak's Patent....dis 35 %
Reiher, Imp. Lifter, list, Oct., 1883....dis 35&5 %
Excelsior....dis 50&10&2 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion)....dis 20&10 %
Wood Bottom....⅌ doz $10.00, dis 30&10 %
All Iron....⅌ doz $4.50 net
Nashua Lock Co.'s....⅌ doz $18.00 dis 50@55 %
Wilson's....dis 50 %
Clipper (Sargent & Co.)....⅌ doz $24, dis 50&10 %
Acme....⅌ doz $20.00, dis 40 %

Tinners' Tools and Machines.
Machines (P. S. & W.)....list add 20 % } dis 10 %
Tools (P. S. & W.)....add 6 % }

Traps.
Game, Newhouse....dis 35 %
Game, Oneida Pattern....dis 60&10 %
Game, Blake's Patent....dis 40&10 %
Mouse, Wood, Choker....⅌ doz holes, 15¢
Mouse, Round Wire....⅌ doz $1.50, dis 10 %
Mouse Cage, Wire....⅌ doz $2.50, dis 10 %
Mouse Catch-'em-alive....⅌ doz $2.50, dis 15 %
Mouse, "Bonanza"....⅌ gross $10 net
Mouse, Delusion....⅌ gross $18.00, dis 20 %
Rat, "Decoy"....⅌ doz $10.00, dis 10 %

Trowels.
Lothrops' Brick and Plastering....dis 25 %
Reed's Brick and Plastering....dis 15 %
Disston's Brick and Plastering....dis 20&10 %
Peace's Plastering....dis 25 %
Clement & Maynard's....dis 20 %
Rose's Brick....dis 15 %
Brade's Brick....dis 25 %
Worrall's Brick and Plastering....dis 20 %
Garden....dis 50 %

Triers.
Butter and Cheese....dis 25 %

Truck, Warehouse, &c.
Penfield Block Co.'s list, 1882....dis 40 %

Twine.

	BC.	B.
No. 12, Flax Twine, ¼ and ½ ℔ Balls	18¢	20¢
No. 18, " " ¼ and ½ "	17¢	18¢
No. 36, " " ¼ and ½ "	17¢	18¢

No. 264, Mattrass, ¼ and ½ "....36¢
Chalk Line, Cotton, ½ ℔ Balls....28¢
Mason Line, Linen, ½ "....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)....14¢
3-Ply " 1 ℔ Balls....14¢
3-Ply " 1½ ℔ Balls....13¢
Cotton Wrapping, 5 Balls to ℔....14¢ @ 20¢
2, 3, 4, and 5 Ply Jute, ½ ℔ Balls....11¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz....17¢

Vises.
Solid Box....dis 50 %
Solid, Peter Wright's....15½¢
Solid, Wilkinson's....14@15¢
Parallel, Fisher & Morris Double Screw....dis 15&10 %
Parallel, Stephens'....dis 25 %
Parallel, Parker's....dis 20 %
Parallel, Wilson's....dis 50 %
Parallel, Howard's....dis 40 %
Parallel, Bonney's....dis 33⅓ %
Parallel, Merrill's....dis 15@20 %
Parallel, Sargent's....dis 60&10 %
Parallel, Backus and Union....dis 40 %
Parallel, Double Screw Leg....dis 15&10 %
Parallel, Prentiss....dis 25 %
Parallel, Simpson's Adjustable....dis 40 %
Saw Filers, Bonney's....⅌ doz $15.00, dis 33⅓ %
Saw Filers, Stearn's....dis 20 %
Saw Filers Hopkins'....⅌ doz $17.50, dis 10 %
Saw Filers, Reading....dis 40&10 %
Saw Filers, Wentworth....dis 20&10 %
Cowell Hand Vises....dis 20 %
Richardson's Vise and Anvil....dis 25 %

Washer Cutters.
Smith's Patent....⅌ doz $12.00, dis 20&10&10 %
Johnson's....⅌ doz $11.00, dis 33⅓ %
Penny's....⅌ doz Pol. $14; Jap'd, $16....dis 55 %
Appleton's....⅌ doz $16.00, dis 60&10 %
Bonney's....dis 30&10 %

Washers.—See Nuts and Washers.

Well Wheels....dis 60& 10 %

Wire.
Brass and Copper, new list, Jan. 18, 1884....dis 20 %
Market, Bright and Annealed, Nos. 0 to 18....dis 67½ %
Market, Coppered....dis 62½ %
Market, Galvanized....dis 55 %
Market, Tinned, Tinned list....dis 57½ %
Stone, Bright and Annealed Nos. 19 to 26....dis 70 %
Stone, Bright and Annealed Nos. 27 to 36....dis 75 %
Stone, Galvanized, Nos. 19 to 30....dis 52½ %
Stone, Tinned, Tinned list....dis 57½ %
Tinned Broom Wire....dis 62½ %
Cast Steel Wire....dis 52½ %
Annealed Fence, Nos. 8 & 9....dis 67½ %
Annealed Grape, Nos. 10 to 14....dis 67½ %
Fence Staples....⅌ ℔ 5@5¼¢
Fence Staples, Galvanized....⅌ ℔ 6@6¼¢
Stubs' Steel Wire....$6.00 to £, dis 30 %
Barb Fence....See Trade Report
Wire on Spools....dis 55 %
Steel Music Wire, Nos. 7 to 30....$1.00 ⅌ ℔
Picture Wire....dis 40&10 %
Clothes Line Wire, Galvanized....⅌ coil 25¢ @ 40¢ net
Wire Cloth, green, drab and black, ⅌ 100 sq. ft....$2.00 @ .25 net

Wrenches.
American Adjustable....dis 45 %
Baxter's Adjustable "S"....dis 33⅓ %
Baxter's Diagonal....dis 35&10 %
Coes' Genuine....cash in 10 days, dis 60&3 %
Coes' "Mechanics'"....dis 60&10&3 %
Coes' Pattern, Malleable....dis 70&15 %
Coes' Pattern, Wrought....dis 75 %
Girard Standard....dis 65 %
Girard Agricultural....dis 70&10 %
Bemis & Call's Patent Combination....dis 30 %
Bemis & Call's Merrick's Pattern....dis 35 %
Bemis & Call's Brigg's Pattern....dis 25 %
Bemis & Call's Cylinder or Gas Pipe....dis 40 %
Aiken's Pocket (Bright)....$6.00, dis 50&10 %
The Favorite Pocket (Bright)....⅌ doz $4.00, dis 40 %
Webster's Patent Combination....dis 25 %
Agricultural Wrenches, Eberhard....dis 33⅓ %
Boardman's....dis 25 %
"Always Ready"....dis 25 %
Donohue's Engineer....dis 25 %

Wringers. Per doz.
Novelty, for Common Tubs, No. 2, 10-inch....$30.00
Novelty, for Common Tubs, No. 3, 11-inch....34.50
Excelsior, for Stationary Tubs, No. E, 10-inch 39.00
Excelsior, for Stationary Tubs, No. F, 11-inch 43.50
Excelsior, with Folding Bench, No. A, 10-inch 48.00
Excelsior, with Folding Bench, No. B, 11-inch 52.50
Universal, No. 2½....30.00
Universal, No. 2....33.00
Adams & Co. No. 8....30.00
Peerless No. 2½....30.00
Peerless No. 3½....34.50
No. 99 Improved 2½....30.00
"Metropolitan," No. 2....33.00
"Metropolitan," No. 2½....30.00
(Net to dis $3 ⅌ doz)

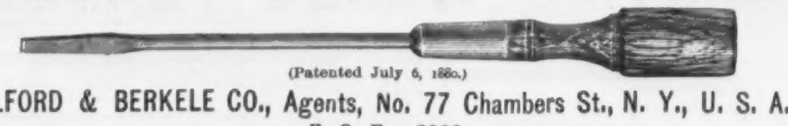
THE JENNINGS & GRIFFIN MANUFACTURING CO.,
MANUFACTURERS OF
Mechanics' Tools and Boring Implements,
SOLE PROPRIETORS OF
THE L'HOMMEDIEU AUGER WORKS,
The Oldest Auger Works in America.

ESTABLISHED BY JOSHUA L'HOMMEDIEU IN 1818.

In ordering Ship Augers be sure that they bear the stamp of *"L'Hommedieu"* or *"Watrous & Co.,"* as these are our only trade-marks. Goods bearing these brands are *fully warranted* by us.

C. E. JENNINGS & CO.,
96 CHAMBERS ST., NEW YORK.

THE ELLRICH HARDWARE MFG. CO.,
MANUFACTURERS OF
SOCKET SCREW DRIVERS.



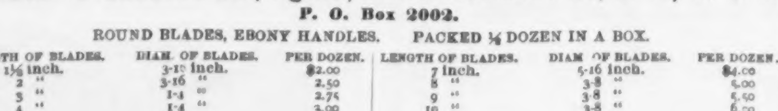
(Patented July 6, 1880.)

ALFORD & BERKELE CO., Agents, No. 77 Chambers St., N. Y., U. S. A.
P. O. Box 2002.

ROUND BLADES, EBONY HANDLES. PACKED ½ DOZEN IN A BOX.

LENGTH OF BLADES.	DIAM. OF BLADES.	PER DOZEN.	LENGTH OF BLADES.	DIAM. OF BLADES.	PER DOZEN.
1½ inch.	3-16 inch.	$2.00	7 inch.	5-16 inch.	$4.00
2 "	3-16 "	2.50	8 "	3-8 "	5.00
3 "	1-4 "	2.75	9 "	3-8 "	5.50
4 "	1-4 "	3.00	10 "	3-8 "	6.00
5 "	5-16 "	3.50	12 "	3-8 "	8.00
6 "	5-16 "	3.75			

SOCKET SCRATCH AWLS.
(Patented July 6, 1880.)



PACKED 1 DOZEN IN A BOX.
With Birch and Maple Handles....$21.00 Per Gross. | With Ebony Handles....$24.00 Per Gross.
DISCOUNT.
Made of the best Jessops Steel, with Patent Metal Sockets. The handles cannot get loose or come off, no matter what strain they are put to in using them. Guaranteed in every respect.

POST'S
Waterproof Belt Oil and Leather Preservative,
FOR WET AND DRY LEATHER BELTING.

TRADE P. O. S. T. OIL MARK.
Registered in the U. S. and Great Britain.

The Standard Belt Oil of the World.

Leather dressed with this oil will not crack or rot, as heat, cold water or gas has no effect on it. It will spread one-third further and last much longer than any oil for the same purpose. It never turns rancid; will keep in any climate. Belts may be run in water at one end and a hot room at the other, and still be soft, dry and pliable. Warranted not to start glue-laps or gum on belts or pulleys, and to keep the surface perfectly smooth.

Beware of Imitations Sold at a Cheaper Price, the Color of which is well Calculated to Deceive.

In their Treatise on Machine Belting, **J. B. HOYT & CO.** speak of Post's Oil as follows:

OILING OF BELTS.

"Care should be taken that belts are kept soft and pliable. For this purpose we decidedly advise the use of **"POST'S WATERPROOF BELT OIL AND LEATHER PRESERVATIVE."** When applied AS DIRECTED, it makes the Belt smooth, pliable and adhesive, and causes it to hug the pulley closely, so that no power is lost from lack of pulley contact. It possesses excellent preservative qualities and also renders the leather more impervious to dampness than any article or preparation we know of.

Moisture should not be allowed to penetrate the laps or joints, as it will dissolve the cement and cause the laps to come apart."

ESTABLISHED AGENCIES.

UNITED STATES:
J. B. Hoyt & Co., New York.
J. & H. Philips, Pittsburgh, Pa.
J. B. Farnum, Woonsocket, R. I.
G. D. Barr, Buffalo, N. Y.
Preston & Nott, Minneapolis Minn.
Post & Co., Cincinnati, Ohio.
J. B. Hoyt & Co., Chicago, Ill.
Langlois & Son, Racine, Wis.
Laurence & Herkner, New York.
Barnum Bros., Troy, N. Y.
Brown Bros. & Co., Providence, R. I.
Jas. H. Billington & Co., Philadelphia, Pa.
Beck & Gregg Hardware Co., Atlanta, Ga.
Covel & Osborn, Fall River, Mass.
J. Ashton & Son, Trenton, N. J.
Geo. A. Smith, Richmond, Va.
W. H. Dillingham & Co., Louisville, Ky.
E. B. Preston & Co., Chicago, Ill.
Cameron & Barkley, Charleston, S. C.
Towner, Landstreet & Co., Baltimore, Md.
C. E. James, Chattanooga Tenn.
C. B. Choate, East Saginaw, Mich.
E. G. Studley & Co., Grand Rapids, Mich.
Mantle & Cowan, Louisville, Ky.
E. F. Bradford & Co., Cincinnati, Ohio.
The J. LeRoy Pine Co., Troy, N. Y.
H. D. Edwards & Co., Detroit, Mich.
Morley Bros., East Saginaw, Mich.
J. H. & N. A. Williams Utica, N. Y.
McGown Bros., San Francisco, Cal.

CANADA:
Robin & Sadler, Montreal.
NEW BRUNSWICK:
R. Chestnut & Sons, Frederickton.
SCOTLAND:
Robert Balderston, Glasgow.
ENGLAND:
O. & W. Ormerod, Rochdale.

If you cannot get POST'S OIL from your Belt Maker, send direct to us and we will see that you do get it.

PRICE, PER GALLON, $1.50.

We solicit Correspondence from Dealers in Manufacturers' Supplies.

E. L. POST & CO.,
No. 10 Peck Slip, New York,
SOLE MANUFACTURERS.

WHOLESALE METAL PRICES, September 3, 1884.

METALS.

IRON.—DUTY: Bars, 8-10¢ to 1 1-10¢ ℔ lb; provided that no Bar Iron shall pay a less rate of duty than 35 %. Sheet, 1 1-0¢ to 1 5-10¢ ℔ lb. Band, Hoop and Scroll, 1¢ to 1 4-10¢ ℔ lb. Railroad Bars weighing more than 25 lb ℔ yard, 7-10¢ of 1¢ ℔ lb.

Standard American Pig Iron.

Foundry No. 1 X	℔ ton	$20.00 @ 21.00
Foundry No. 2 X	℔ ton	18.50 @ 19.00
Gray Forge	℔ ton	17 00 @ 18.00

No. 1 Scotch Pig Iron.

Carnbroe	℔ ton	20.50 @ 21.50
Coltness	℔ ton	@ 22.00
Shotts	℔ ton	21.50 @ 22.00
Glengarnock	℔ ton	20.50 @ 21.50
Gartsherrie	℔ ton	21.00 @ 22.00
Langloan	℔ ton	21.50 @ 22.00
Summerlee	℔ ton	20.75 @ 21.00
Dalmellington	℔ ton	@ 20.00
Eglinton	℔ ton	19.25 @ 19.50
Clyde	℔ ton	@ 20.00

Rails.

Steel, at Eastern mills	℔ ton	27.00 @ 28.00
Old Rails, Ts	℔ ton	18.00 @ 18.50

Scrap.

Wrought, ℔ ton, from yard ..... 19.00 @ 20.00

Bar Iron from Store.

Common Iron:		
¾ to 1 in. round and square	℔ lb 2	@ 2.10¢
1 to 6 in. x ¾ to 1 in		
Refined Iron:		
¾ to 2 in. round and square	℔ lb 2.10	@ 2.20¢
1 to 6 in. x ¾ to 1 in		
1 to 6 in. x ¼ and 5-16	℔ lb 2.30	@ 2.40¢
Rods—⅝ and 11-16 round and sq	℔ lb 2.20	@ 2.25¢
Bands—1 to 6x3-16 to No. 12	℔ lb 2.50	@ 2.60¢
"Burden's Best" Iron, base price		℔ lb 3¢
Burden's "H. B. & S." Iron, base price		℔ lb 2.6¢
Norway Nail Rods		5¼ @ 6¢

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
Nos. 10 to 16	℔ lb 2.70 @ 3 ¢	3¼¢
17 to 20	℔ lb 3 @ 3.12½	3¼¢
21 to 24	℔ lb 3.20 @ 3.25	4 ¢
25 and 26	℔ lb 3.50 @	4 ¢
27	℔ lb 3⅝ @	4¼¢
28	℔ lb 3.75 @ 4 ¢	4½¢
	B B.	2d qual.
Galvanized, 10 to 20	℔ lb 6 ¢	5¼¢
Galvanized, 21 to 24	℔ lb 6½¢	5¾¢
Galvanized, 25 to 26	℔ lb 7 ¢	6¼¢
Galvanized, 27	℔ lb 7½¢	6¾¢
Galvanized, 28	℔ lb 8 ¢	7¼¢
American Russia	℔ lb 10½¢	B, 9 ¢
Russia	℔ lb 11½¢	@ 14 ¢
American Cold Rolled B. B	℔ lb 5 ¢	@ 7 ¢

Iron Wire. *See Wire.*

STEEL.—DUTY: Ingots, Bars, Sheets, &c., valued at 4¢ ℔ lb or less, 45 % ad. val.; valued above 4¢ and not above 7¢ ℔ lb, 2¢ ℔ lb; valued above 7¢ and not above 10¢ ℔ lb, 2½¢ ℔ lb; valued above 10¢ ℔ lb, 3½¢ ℔ lb. *Extras.*—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1½¢ ℔ lb in addition to above; Steel Circular Saw Plates, 1¢ ℔ lb addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

English Steel.

Best Cast	℔ lb 15½¢
Extra Cast	℔ lb 16½ @ 17½¢
Circular Saw Plates	℔ lb 14½¢
Round Machinery, Cast	℔ lb 10½¢
Swaged, Cast	℔ lb 16½¢
Best Double Shear	℔ lb 15½¢
Blister, 1st quality	℔ lb 14 ¢
German Steel, Best	℔ lb 10 ¢
2d quality	℔ lb 9 ¢
3d quality	℔ lb 8 ¢
Sheet Cast Steel, 1st quality	℔ lb 15½¢
2d quality	℔ lb 14½¢
3d quality	℔ lb 12½¢

TIN.—DUTY: Plates, Sheets, Tagger and Terne, 1¢ ℔ lb; Bars, Block and Pigs free.

Banca	℔ lb @ 21½¢
Straits	℔ lb 19½¢ @ 20 ¢
English	℔ lb 20½¢ @ 21 ¢
Bar	℔ lb @ 21 ¢

Charcoal Tin Plates.

I C 10x14 } I C 12x12 }	225 sheets	℔ box $5.50	@ $6.25
I C 20x28, 1	"	" 12.00	@ 13.00
I X 10x14 } I X 12x12 }	225 "	" 7.00	@ 8.00
I X 14x20, 112	"	" 7.00	@ 7.75
D C 12½x17, 100	"	" 5.25	@ 5.75
D X 12½x17, 100	"	" 6.50	@ 7.25
For each additional X add		"	@ 1.50

Coke Tin Plates.

	Best.	Ordinary.
I C 10x14 } I C 14x20 }	$5.50	$5.00 @ $5.20
I C 12x12	5.62½	5.25 @ .....
I C 19x20, gutters, 225 sheets	8.25	7.75
I C 20x28, 112 sheets		10.50

Terne Plates.

	Prime Char. 3d. quality	Coke.
I C 14x20 M. F.	7.25	
I C 14x20 Tregoning, Old Process		$7.00
I C 20x28	" "	14.50
I C 14x20	$5.00 @ $5.12½	$5 @ 4.87½ @ $5
I X 14x20	6.50 @	
I C 20x28	10 25 @ 10.00 @	9.75 @
I X 20x28	13.00 @	
I C 20x300	13.50 @	

Tin Boiler Plates.

IXX 14x26, 2 sheets for No. 7, 112 sheets	@ $18.50
IXX 14x28, 2 " " No. 8, "	@ 14.50
IXX 14x31, 2 " " No. 9, "	@ 16.00

COPPER.—DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ℔ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot, Lake	℔ lb 15¢	@ 15½¢
Ingot, Baltimore	" 14¢	@ 14½¢
Braziers' Copper, ordinary sizes, 16 oz. ℔ sq. ft. and over		@ 22 ¢
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz. ℔ sq. ft.	"	@ 24 ¢
Braziers' Copper, 10 oz. and 12 oz. ℔ sq. ft.	"	@ 27 ¢
Lighter than 10 oz. ℔ sq. ft.	"	@ 29 ¢
Circles less than 84 in. in diam.	"	@ 25 ¢
" 84 in. diam. and over	"	@ 28 ¢
Segment and Pattern Sheets	"	@ 25 ¢
Locomotive Fire-Box Sheets	"	@ 23 ¢
Sheathing Copper, over 12 oz. ℔ sq. ft.	"	@ 20 ¢
Bolt Copper	"	@ 23 ¢
Copper Bottoms	"	@ 23 ¢
Nickel-Plated Sheathing	"	@ 35 ¢
" " for boilers	"	@ 37 ¢
Plating extra	" 25 ¢	@ 37 ¢
Flat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes	"	@ 23 ¢

Tinning.

14x48, by the case	℔ sheet, 8¢
14x48, less than case	" 8¢

For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper.—Net.

14x48

2 and 16 oz. and heavier	35¢ By the case. ℔ lb 34¢
12 oz. and lighter	36¢ " " " 37¢

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.

14 and 16 oz. and heavier	37¢ By the case. ℔ lb 36¢
(And all sizes not over 20 in. wide.)	
14 and 16 oz. and heavier	℔ lb 39¢
12 oz.	" 42¢

Copper Wire.—(*See Wire.*)

Sheathing Metal.

ellow Sheathing Metal, ℔ lb	20 @ ...

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884 ..... dis. 30 %

LEAD.—DUTY: Pig, $2 ℔ 100 lb; Old Lead, 2¢ ℔ lb; Pipe and Sheet, 3¢ ℔ lb.

American	4¢
Bar	4½ @ 4¾¢
Pipe	5¾¢
Block Tin Pipe	40¢
Tin Lined Pipe	15¢, dis 20 %
Sheet	6¾¢, dis 20 %
Shot	Drop, 6¢; Buck, 7¢
Chilled Shot	7¢

ANTIMONY.

Hallett's	℔ lb 11 @ 11¼¢
Cookson	" 11½ @ 11¾¢

SPELTER—Duty: Pigs, Bars and Plates, $1.50 ℔ 100 lbs.

American, cash	4¾¢ @ 5¼¢
Bergenport	9¢

ZINC—Duty: Pig or Block, $1.50 ℔ 100 lbs. Sheet, 2½¢ ℔ lb.

600 lb casks	5¾ ℔ lb.
Zinc.—Open	6 @ 6¾¢
Zinc Tubing	dis. 10 @ 20 %

Zinc Tubing—Dis. 25 %.

Plain	.27
Fancy	.33
Scotch and Extra Patterns	.36

BABBITT METAL.

N. P. U	℔ lb 7½¢

A. 28¢; B, 22¢; C, 14¢.

WIRE.

Iron Wire.—Put up in 63 lb bundles.

Nos. 00 to 9,	10,	11,	12,	13,	14,	15,	16,	17,	18.
	10	11	11¼	12½	14	15	16		
Bright Market Wire								dis 65 %	
" Charcoal								dis 47½ %	
" Bale Wire, Nos. 7 to 12								dis 60 %	

Annealed Market Wire	dis 65 %
" Fence Wire, Nos. 8 and 9	
" Grape Wire, Nos. 10 to 14	
" Bessemer Steel Wire	dis. 57½ @ 60 %
Coppered Market Wire	dis. 60 %
" Bale Wire, Nos. 7 to 12	dis. 60 %
Galvanized Market Wire	dis. 50 %
" Fence Wire	
Galvanized Stone Wire	" 45 @ 50 %

Stone or Weaving Wire.

Nos.	16	17	18	19	20	21	22	23	24	25	26
Cents	14	15	16	19	20	21	22	23	24	25	26
Nos.	27	28	29	30	31	32	33	34	35	36	..
Cents	28	29	30	32	33	35	37	40	45	55	..

Nos. 16 to 18	dis. 62½ @ 65 %
" 19 to 26	" 65 @ 67½ %
" 27 to 36	" 67½ @ 70 %
Galvanized Stone Wire	" 45 @ 50 %

Steel Wire.

Cast Steel, Stee Wire list	dis. 50 %

Brass and Copper Wire.

Old English Gauge the Standard.—Dis 20.

	Common High Brass	Low Brass	Gilding Bronze and Copper.
All Nos. to No. 16, inclusive	$0.22	$0.26	$0.30
No. 17 and 18	.23	.27	.31
" 19 and 20	.24	.28	.32
" 21	.25	.29	.33
" 22	.26	.30	.34
" 23	.28	.32	.36
" 24	.30	.34	.38
" 25	.32	.36	.40
" 26	.35	.39	.43
" 27	.38	.42	.46
" 28	.42	.46	.51
" 29	.45	.49	.54
" 30	.48	.52	.62
" 31	.51	.55	.67
" 32	.55	.59	.73
" 33	.59	.63	.82
" 34	.64	.68	.95
" 35	.70	.74	1.30
" 36	.76	.80	1.50
" 37	1.00	1.04	1.70
" 38	1.30	1.34	2.00
" 39	2.00	2.00	3.25
" 40	2.60	2.60	5.75

Spring Wire, 2 cents per pound advance. Whitened Wire, 3 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more, 2 cents per pound extra.

MISCELLANEOUS TINNERS' STOCK.

Solder.

½ & ⅓, Warranted	12½ @ 13 ¢
Extra	11¼ @ 11½¢
No. 1 Refined	10¼ @ 10½¢
No. 2 "	10 @ 10¼¢
Extra wiping	10½ @ 11 ¢

Rivets.

Iron and Tinned, new list, Dec. 10, 1881	dis. 40 %
In bulk, new list, Dec. 10, 1881	dis. 40 %
Copper Rivets and Burrs	dis. 50 %

Nos..	7	8	9	10	11	12	13	14	1
℔ lb..	49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Stove Bolts.

American Screw Co.'s	dis. 60 %
R. B. & W	dis. 60 %
R. & E. Mfg. Co	dis. 60 %

GLASS.

Prices current per box of 50 feet.

List, July 2, 1883.

Single.

Sizes.	1st.	2d.	3d	4th.
6 x 8 to 10 x 15	$13.50	$11.50	$10.75	$10.25
11 x 14 to 16 x 24	14.50	13.50	12.50	11.50
18 x 22 to 20 x 30	18.50	17.00	15.50	14.00
15 x 36 to 24 x 30	20.50	18.50	16.25	
26 x 28 to 24 x 36	22.00	20.00	17.50	
26 x 36 to 26 x 44	24.00	22.00	18.50	
26 x 46 to 30 x 50	26.00	24.00	20.50	
30 x 52 to 30 x 54	27.00	25.00	21.50	
30 x 56 to 34 x 56	29.00	27.00	24.00	
34 x 58 to 34 x 60	31.00	29.00	26.00	
36 x 60 to 40 x 60	35.00	31.00	29.00	

Double.

Sizes.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$17.50	$15.00	$14.00	$13.00
11 x 14 to 16 x 24	20.00	18.00	16.50	
18 x 22 to 20 x 30	24.00	22.00	20.00	
15 x 36 to 24 x 30	26.50	24.00	21.00	
26 x 28 to 24 x 36	29.00	26.00	23.00	
26 x 36 to 26 x 44	30.00	28.00	24.00	
26 x 46 to 30 x 50	33.00	31.00	27.00	
30 x 52 to 30 x 54	35.00	32.00	28.00	
30 x 56 to 34 x 56	37.00	34.00	30.00	
34 x 58 to 34 x 60	40.00	37.00	33.00	
36 x 60 to 40 x 60	45.00	40.00	37.00	

Sizes above—$15 per box extra for every 5 inches. An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the united 84 inches bracket.

Discount 75 and 5.

PAPER STOCK, &c.

(*Dealers' Selling Prices.*)

	Cents ℔ lb.
White Shirt Cuttings, No. 1	6¾ @ 7
" " No. 2	4½ @ 5
Mill Assorted Whites	5¾ @ 5½
Unbleached Muslins	5 @ 5½
City Whites, No. 1	4¼ @ 4½
New Canton Flannels	@ 4½
New Seconds, light	3½ @ 3¾
" dark	2¾ @ 3
No. 2 Whites	2¼ @ 2¾
Cotton Canvas	4 @ 4½
Linen Canvas No. 1	4½ @ 4¾
Seconds, City No. 1	1¾ @ 1¾
Seconds, City No. 2	1 @ 1¼
Colors, ℔ cwt	40 @ 50
Manila Rope	2¾ @ 3
" Tarred	2½ @ 2¾
Gunny Bagging, No. 1	1¾ @ 2
" No. 2	1½ @ 1¾
Kentucky Bagging	4 @ ...
Burlap Bagging, No. 1	1¾ @ 2
Tar Shakings	1¾ @ 2
Hemp Twine Stock	3½ @ 4
Hard White Shavings, No. 1	3¾ @ 4
Soft White Shavings, No. 1	2¾ @ 3
White Shavings, No. 2, Soft	2 @ 2½
Mixed Shavings, part White	2 @ 2½
Ledger and Writing	2½ @ 2¾
Solid Stock	1¾ @ 2
Book Stock, No. 1, light	1 @ 1½
Old Newspapers	1¼ @ 1
Pure Manilas	1¼ @ 1
Bogus Manilas and Hardwares	½ @ ..
Commons, ℔ 100 lb	60 @ 70
Binders' Board Cuttings	½ @ 1
Straw Board Cuttings, ℔ cwt	70 @ 75

PAINTS, OILS, &c.

Paints.

Black, Lamp—Coach Painters'	℔ lb 22 @ 24¢
" " Ordinary	6¢
" Ivory Drop, fair	12 @ 15¢
" " best	23¢
Black Paint, in oil	kegs, 8¢; assorted cans, 11¢
Blue, Prussian, fair to best	40 @ 55¢
" " " in oil	45 @ 55¢
" Chinese dry	70¢
" Ultramarine	18 @ 30¢
Brown, Spanish	11¢
" Van Dyke	10 @ 12¢
Green Chrome	15 @ 23¢
" " in oil	14 @ 18 @ 25¢
" Paris	good, 20¢; best, 25¢
" " in oil	good, 30¢; best, 35¢
Iron Paint, Bright Red	℔ lb 2½¢
" Brown	" 1½¢
" Purple	" 3¢
" Ground in oil, Bright Red	" 6½¢
" " " Red	" 5½¢
" " " Brown	" 5½¢
" " " Purple	" 5¢
Mineral Paints	2 @ 4¢
Orange Mineral	10¢
Red Lead, American	7¢
" Venetian (Eng.) dry	$1.65 @ $1.70
" " in oil	asst'd cans, 11¢; kegs, 8¢
" Indian Dry	9 @ 12¢
Rose Pink	10 @ 13
Sienna, American Raw, powdered	4¢
" Burnt, powdered	4½¢
" " in oil	10 @ 16 @ 20¢
" Raw	11 @ 15 @ 25¢
Umber, Burnt, powered	4 @ 8¢
" " in oil	9 @ 12 @ 16¢
" Raw, powdered	3½ @ 7½¢
" " in oil	10 @ 16 @ 48¢
Vermilion, Chinese	90¢
" English	46 @ 48¢
" American, Common	15¢
White Lead, American, pure dry	6¢
" " in oil	6¢
White Paris, English Prime	2 @ 2½¢
Yellow Ochre, French	$1.75
" " in oil	asst'd cans, 11¢; kegs, 8¢
" " Vermont	In casks, 1½¢
Yellow Chrome	17 @ 27¢
" " in oil	14 @ 18 @ 25¢
Zinc White, American No. 1, dry	5 @ 6¢
" " No. 1, in oil	9¢
" French (Paris Dry)	6 @ 8¢
" " in oil	10 @ 11¢

Oils.

Linseed, Raw, in casks and bbls	54 @ 55¢
" Boiled, " "	57 @ 58¢
" Calcutta	56 @ 57¢
Bleached Whale, ℔ gal	63¢
" Sperm	$1.C8
" Elephant	75¢
Signal	72¢
Prime Lard	64¢
No. 1 Extra	57¢
West Virginia	8 @ 12¢
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Neatsfoot	60 @ 68¢
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Empire Cylinder Oil	65¢
Machinery	40¢
Engine	50¢

Sundries.

Asphaltum, Cuban	6½ @ 9½
" Egyptian	9 @ 10¢
Benzine	℔ gal. 9 @ 10¢
Chalk	3¢
" Block	¾¢
Dryers, Patent American	asst'd cans, 9¢; kegs, 7¢
Frostings	40c
Glue, White	24 ℔ 35¢
" Sheet	20¢
Glaziers' Points, Zinc	8¢
Gum, Copal	36¢
" Damar	25¢
" Shellac, English	40¢
" " dark	35¢
Litharge	7½c
Mineral Wool, ordinary, ℔ lb	1 @ 1¼¢
" extra	3 @ 3½¢
Pumice Stone, selected Lumps	4 @ 6¢
" " powdered	$2.75
Pine Tar, bbls	$2.50
Pitch	$1.70
Putty, in bladders	3¢
" in bulk	2½c
Rosin—Common and Good—Strained	$1.90
E & F	$2.10 @ $2.20
G & H	$2.30 @ $2.50
I & K	$2.60 @ $2.80
M & N	$3.00@ $3.50
Spirits Turpentine, ℔ bbl	31½ @ 32½¢
Whiting, Spanish	1¾¢
Waste, No. 1 Cop	9½¢
Waste, No. 1 White Machine	9½¢
Waste, No. 2 White Machine	8¢
Waste, No. 1 Colored	7c
Waste, No. 2 Colored	6½¢
Waste, Washed Machine	9¢

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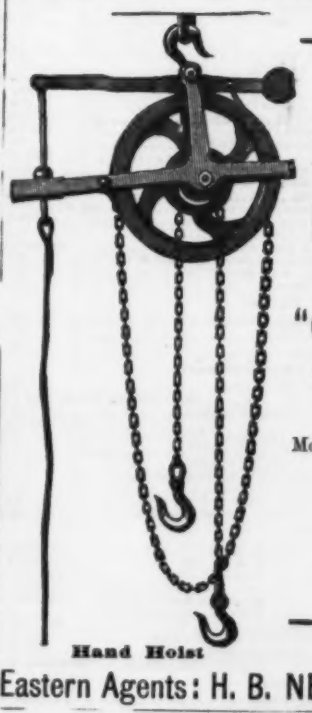

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NEW PUBLICATIONS.

WAGES, LIVING AND TARIFF. By E. A. Hartshorn. Size, 5¾ x 4¼ inches, 101 pages, pamphlet edition. Published by Wm. H. Young. Price 30 cents.

This little book is written primarily with the object of showing the good effects that have been wrought in this country by a protective tariff, and meeting the usual arguments advanced by the free traders. The subject matter is classified under 22 chapters. The author begins with definitions of labor and wages, and with the latter presents comparative tables of wages here and in England, the figures in which show the advantageous position held by the American laborer. Following are a few chapters devoted to prices, cost of living, &c., after which the question of home and foreign markets is discussed in relation to the prosperity of our home industries. The next few chapters are devoted to overproduction, reduction of revenue, and other equally important questions. Chapter XIX, headed, "In Other Countries," treats of the rate of wages and the cost of living here and abroad, the figures being reduced to dollars and cents, so that comparisons are easily made. The pamphlet closes with a brief comment on the workings of the Cobden Club, a letter on the evils of free trade by Sir Edward Sullivan, and a few final remarks on American labor.

THE FALLACIES IN PROGRESS AND POVERTY. By William Hanson. Size, 7⅛ x 5 inches, 191 pages. Published by Fowler & Wells Company. Price, $1.

It is hard to believe that the pleasure of seeing one's name in print should be the only cause of certain books being written, but it seems impossible to assign any better reason for the production of many writings of the present day, from whose shallowness the reader can draw no single truth to repay his labor, and whose fallacies are not even ingenious enough to excite interest. The full title of the book under consideration is, "The Fallacies in Progress and Poverty; in Henry Dunning Macleod's Economics, and in Social Problems; with the Ethics of Protection and Free Trade, and the Industrial Problem Considered *A Priori*." The work opens with a review of "Macleod's Economics," the fundamental statements in which Mr. Hanson disposes of in a most summary manner, and proves, to himself at least, that Macleod's definitions of wealth and value are entirely false. Such a fatal blow having been struck at Macleod's theories, it is unnecessary for us to follow the author further in his annihilating process. Passing on, the second chapter we meet is "The Fallacies in Progress and Poverty," and as Mr. Hanson has given it the leading place in the title of his book, it is but right that we accord it a rather more extended comment. Beginning his review with Mr. George's definition of wages, wealth, capital and land—the definition of wealth, by the way, he slightly misquotes, with the result of bringing it more in conformity with his own ideas—Mr. Hanson proceeds to expound "Progress and Poverty" by the aid of frequent and extensive citations, agreeing heartily with the author through the first part of his book, but taking decided ground in opposition to Mr. George's theory of the origin of interest. Mr. George's statement that the monopolization of land is the cause of universal competition in its most virulent form elicites our author's earnest approval; but when he fails to add that it is also the cause of interest, Mr. Hanson opens on him the fire of his criticism, and all but accuses him of moral cowardice. He then endeavors to prove that interest, instead of being caused, as Mr. George holds, by the return which capital can secure, less insurance and wages, arises entirely from the unjust monopolization of land, and that its very existence is a proof of the wickedness of man. The last error detected in Mr. George's theories, but necessarily a most fundamental one, is in the remedy of social evils by the appropriation of rent by Government, Mr. Hanson's substitute for it, which we do not clearly comprehend, being the elevation of the moral status of the people, followed by a repeal of the laws governing the monopoly and sale of land, the land thus reverting to the ownership of the State, to be afterward apportioned by lot or otherwise to the needy citizens desiring homes. Dismissing "Progress and Poverty," Mr. Hanson next advances to the attack of Henry George's more recent work "Social Problems," which he disposes of in a few pages of comment, ending with a repetition of his remedial plan. In his article, "Ethics of Protection and Free Trade," our author would have us clearly understand that in this enlightened age morality in trade is only conspicuous by its absence, and that until man attains a higher plan of unselfishness, and consents to share his land with his neighbor, all present evils will continue. In "The Industrial Problem Considered *A Priori*" Mr. Hanson devotes considerable space to proving that interest and profit are most unjust, and should consequently be abolished. The book closes with a short chapter entitled "The Ideal Man," which, being an exegesis of the teachings of the New Testament, does not fall within our province; we, therefore, dismiss it with a simple mention. The numerous questions in this book are dealt with from a semi-religious standpoint, but, as history clearly proves that any attempt in the past to combine temporal and spiritual power has met with but ill success, it is safe to predict that no such conjunction in the future would achieve a betterment in man's condition.

The managers of the Lackawanna Iron and Steel Company, of Scranton, Pa., have resolved to reduce the wages of all the company's employees 15 per cent. on the 1st of October, and have sent out notices to that effect. The reduction will apply to the salaries of the officers as well as to the wages of the ordinary workmen. The company employ nearly 3000 men, and the news of the proposed reduction has had the effect of making the most of them feel discouraged over the prospect. At the beginning of the present year the wages of all the foremen and laborers in the blast furnaces, steel mills and foundries of this corporation were reduced 10 per cent., which all accepted without a murmur. Next October the men will be paid 25 per cent. less than they received in October of last year. The works have not been idle at any time during the year, except when they were shut down for repairs. Mr. B. G. Clarke states that the men will be given steady work during the fall and winter, and that though the company are now working for nothing, they will endeavor to keep their works in operation for the sole purpose of giving the workmen employment.

HARDWARE NOVELTIES.

Improved Shell Extractor.

Mr. M. O. Wagmire, of Garfield, Kan., has recently patented an Improved Shell Extractor for breech-loading firearms, which we illustrate in application and detail in the accompanying cuts. Fig. 1 presents a perspective view of the gun, with extractor attached, a perspective view and also the manner of application of the extractor being shown in the two smaller figures. Fig. 2 is a sectional elevation, taken between the barrels of a double-barreled gun, showing the extractor in place. Fig. 3 is a view of the extractor removed, and Fig. 4 is an end elevation of the barrels of a double-barreled gun, showing the plate portion or head of the extractor. A A, Fig. 4, represent the barrels of a gun between which the extractor B is placed in any approved manner. The extractor B, Fig. 3, is composed of the stem *a*, plate portion or head *b*, and the brace *c*, shown in Fig. 2. The brace *c* is made of steel in the form of a fin, secured in the angle made by joining the stem *a* and head *b*, so that, while it braces the head *b*, it at the same time serves to stiffen the stem *a*, thus making, it is claimed, the extractor strong and rigid in all directions, so that it is as durable as the other parts of the gun. The fin *c* is, by preference, beveled off at its forward or inner end, as shown at *c'* in Fig. 2, to avoid unnecessary cutting of the barrel. An important advantage claimed for this extractor is its stiffness, which prevents it from slipping past the shell cartridge when operated.

Fig. 1.—Improved Shell Extractor.

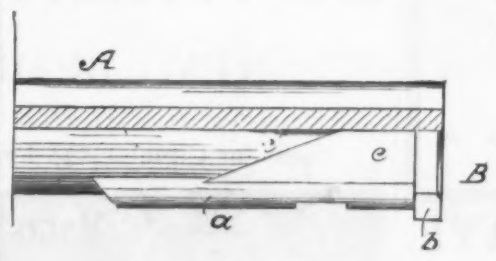


Fig. 2.—Sectional Elevation.

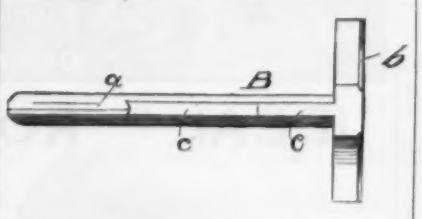


Fig. 3.—View of Extractor Removed.

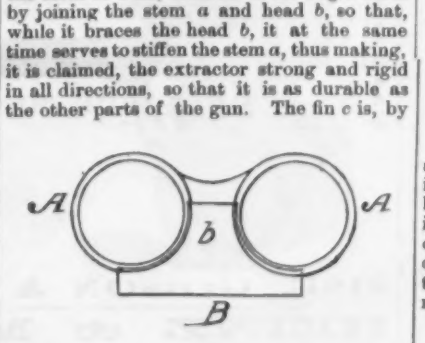
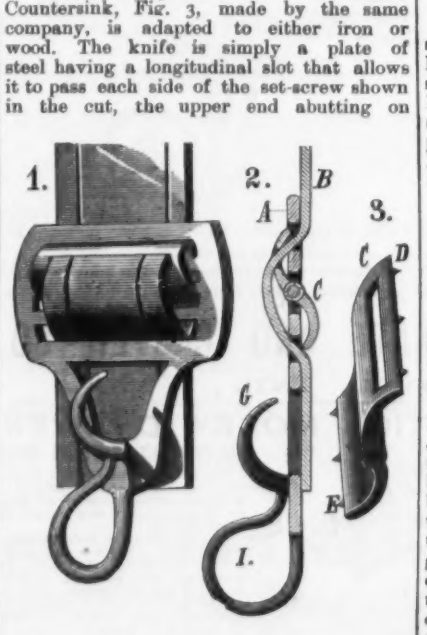


Fig. 4.—End Elevation of Barrels.

Back-Band Buckle.

The main frame of the Buckle is formed with two parallel transverse slots, through which the back band B passes from the back, and between which is a third slot in which is pivoted a clasp plate, Fig. 3, that curves in reverse directions at each side of its pivot to form the opposite clasping edges. The back band is passed through the slot in the plate, as shown in Fig. 1. It is apparent that any downward pull upon the buckle will act by the pressure of the band upon the upper half of the plate, and above its pivots, to force the clasping edges firmly upon the band at the reverse sides of the frame. The edges D E are formed with prongs to secure a firmer hold of the buckle on the band. At the lower edge of the buckle frame is a downward extension, on the face of which is formed a hook, G, whose point reaches nearly to the plane of the face of the frame. By this means a space is secured between the main body of the hook and the frame in which the trace chain may be supported. In placing one of the trace links upon the hook it may be pushed partly into the opening in the extension. A loop, I, formed on the extreme end of the extension serves to hold the rein up from the ground. The band passes over the animal's back and carries a buckle with trace and rein hooks near each end and at each side of the animal. The double hold of the clasp plate upon opposite faces of the band affords greater security against tearing and slipping than a single-toothed edge acting on one face of the band would. This invention has been patented by Mr. P. S. Pender, and further information can be obtained from Mr. Samuel A. Haines, 88 Chambers street, New York.



Pender's Back-Band Buckle.

Some New Tools.

The "Always Ready" Wrench, as the makers style it, illustrated in Fig. 1, is intended especially for bicyclists, or light machinery of any kind not requiring a heavy wrench. Particular attention has been paid by the manufacturers, the Portsmouth Wrench Company, of 140 Congress street, Boston, to the cutting of the teeth, avoiding, they claim, all damage to a finished or painted nut. The Adams Countersink, Fig. 3, made by the same company, is adapted to either iron or wood. The knife is simply a plate of steel having a longitudinal slot that allows it to pass each side of the set-screw shown in the cut, the upper end abutting on a collar which runs on a screw-thread cut in the shank. By turning this collar the knife is pushed forward or allowed to push in, as the case may be, depending upon the direction of rotation of the collar. The end of the collar next to the knife is coned internally, thus holding the knife which is made to fit it. The knife is easily sharpened and adjusted for wood or iron, while, on account of its simple construction, it is impossible, they say, for it to get out of order. The Brad Awls, also made by the Portsmouth Wrench Company and illustrated in Fig. 2, are made from Jessop's steel and carefully tempered. Their appearance is made sufficiently clear in the cut, so they need no further explanation. Among the advantages claimed for these awls is that, in entering hard wood they are easily withdrawn, and necessitate no pulling or jerking to release them. They also, it is said, leave a clean bore free from fiber, so that a pin or nail the full size of the bore can be inserted without danger of splitting the wood.

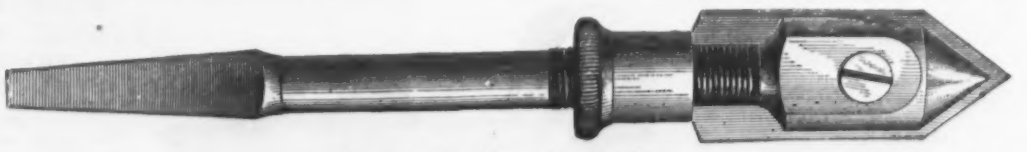


Fig. 3.—The Adams Countersink.

The Supply of Platinum.

The platinum diggings of Russia, observes an exchange, are near Bogoslowsk, Miask, Newjansk and Nischnei Tagil-k, in the Ural Mountains. They were discovered in 1824, and at six places—in 1868, 1869 and 1870—from 494,000, 367,000 and 263,000 tons of sand, 6675, 7770 and 6455 pounds of raw platinum were obtained respectively. The metal contains always some other substances; thus Le Play found, in a sample from Nischnei Tagilsk, 75.1 platinum, 1.1 palladium, 3.5 rhodium, 2.6 iridium, .6 osmiridium, 2.3 osmium, .4 gold, 1 copper and 8.1 iron. The raw metal is almost entirely sold to England and Paris, at a price of about £14 per pound of pure metal. It is there refined before it can be worked up into manufactured articles. Of such objects we found at the Vienna Exhibition some chemical apparatus by Demoutis, Quenessen & Co., who hold a leading position in Paris, and Heraus, of Hanau, in Germany, the former firm also showing metallic ruthenium and palladium. The prize for such work, however, is due to Johnson, Matthey & Co., of Hatton Garden, London, who exhibited a splendid platinum still for sulphuric-acid works, worth about £3500 There was also an ingot of palladium, worth about £2000, which had been extracted from a mass of platinum of a value of over £1,000,000. Very remarkable, also, was a nugget of platinum, weighing 4728 grams, in a collection of platinum sand and washed platinum, while the alloys of iridio-platinum and platino-iridium deserved great attention, the latter being intended for normal meters, and being smelted in lime crucibles, after the method of Deville. Among the exhibits from New Zealand was also a sample of ferriferous platinum sand from Orepuki diggings, north shore of Foveaux Straits. The extracted metal contains 85.37 platinum, with a little iridium, 13.65 iron, and .98 gold and quartz. In the Imperial Brazilian Museum's collection were also some samples of platinum sand and platinum from Minas Geraes, in Brazil, where its original matrix is sienite. The annual produce of platinum in Brazil, Columbia, California and Borneo seems not to exceed about 1000 pounds.

Some New Tools.—Fig. 1.—"Always Ready" Wrench.

Fig. 2.—Series of Brad Awls, Made by the Portsmouth Wrench Co.

LATEST LEGAL DECISIONS.

PARTNERSHIP—NON-TRADING FIRM—PROMISSORY NOTE.

M and L were livery-stable keepers, and M borrowed money for his individual use, and gave the firm note therefor. Payment was refused and in an action upon it the plaintiff was defeated. He carried the case—Levi *vs.* Latham—to the Supreme Court of Nebraska, where the judgment was affirmed. Judge Reese, in the opinion, said: "We think that the rule of law is that one member of a non-trading firm has no authority to bind his copartner by a note made by him in the firm name without express authority therefor from his copartner, or when the giving of such instrument is necessary to the carrying on of the partnership business, or is usual in similar partnerships; and the burden is upon a party suing on a note given by one member of such firm to prove such authority or usage."

FACTOR'S LIEN—BALANCE OF ACCOUNT.

S & S were the factors of M, and had lumber of theirs in hand. Under an execution the sheriff levied on this lumber to sell it to the extent of the factor's lien, It appeared that there was a large general balance due to M when the lumber seized was forwarded, and that $2500 was paid to M at the time the lumber was received. The sheriff insisted that this payment of $2500 was a charge upon this identical lumber, and M claimed that it must be presumed that this payment was on account of the general balance due. The court below decided in favor of M, and the sheriff took the case—McGraft *es.* Rugee—to the Supreme Court of Wisconsin, where the judgment was affirmed. Judge Cassoday, in the opinion, said: "Where the general balance on the accounts of the factorage is largely against the factor and in favor of the principal, the former can have no lien upon the property in his possession, for he has no enforceable claim. In such case the factor's right of retention and sale is merely to reimburse himself for the balance due him on the general account of the factorage. Neither can a factor who is indebted to his principal on account of previous sales acquire a particular lien upon goods subsequently sent to him for sale for expenses incurred on account of them, unless such expenses exceed the amount of his indebtedness. The lien of an agent and factor on the goods of his principal for specific expenses does not exist when the general balance of account is against him. We must therefore hold that where a factor is largely indebted to his principal on account of the factorage, and thereupon voluntarily makes advances in the business not exceeding such indebtedness, such advances, being made and in behalf of the principal, must be deemed to have been made by the factor in liquidation of his indebtedness to that extent."

MONEY INTRUSTED BUT APPROPRIATED—RECOVERY FROM ASSIGNEE.

N gave his check for $469 to W for the purpose of having W pay back taxes due of his (N's) lands. The check was drawn to W as county treasurer. W kept two bank accounts, one at Marquette and the other at Lansing. He deposited the check at Marquette and drew against it for his own uses. He did not pay the taxes, and becoming a defaulter he assigned his property to R, one of his sureties, and the assignment carried with it the balance W had in bank—at Marquette $91, and at Lansing $1423.44. N sued R, claiming that the bank balances to the extent of his check, $469. were chargeable as for money intrusted to W; that it must be presumed that this sum of $469 was therein contained. The defendant had judgment and the plaintiff carried the case—Neely *vs.* Rood—to the Supreme Court of Michigan, where the judgment was affirmed. Judge Champlin, in the opinion, said: "The rule contended for by the plaintiff is well settled that where property held upon any trust to keep, to use or to invest in a particular way is misapplied by the trustee and converted into different property, or is sold and the proceeds are thus invested, the property can be followed wherever it can be traced through its transformations, and will be subject when found, in its new form, to the rights of the original owner or beneficiary. But it is essential to the operation of a beneficial title to a trust fund that it can be clearly traced into the hands of the party to be charged, though no more than proof of substantial identity is required. It is not claimed that the money here could be identified, and the court below laid down the proper rule of trust. Where the trust property does not remain in specie, but has been made away with by the trustee, the beneficiaries have no longer any specific remedy against any part of his estate in bankruptcy or insolvency, but they must come in as general creditors and prove against the trustee's estate for the amount due them."

INTERSTATE EXTRADITION.

B was arrested in Indiana upon the requisition of the Governor of Wisconsin, upon a charge of embezzlement, was returned to Wisconsin, and there tried and acquitted. He was immediately arrested on a charge of obtaining property by false representations, and sued out a writ of *habeas corpus*, relying on the ground that he could not be held for any offense in the State except upon that for which he was charged and extradited. He was remanded and carried the proceedings—State *ex rel.* Brown *vs.* Stewart—to the Supreme Court of Wisconsin, where the order below was affirmed. Judge Cassoday, in the opinion, said: "Treaty stipulations between nations frequently guarantee to the fugitive the right to leave the demanding country after the trial for the offense for which the fugitive has been surrendered, in case of acquittal, or in case of conviction, after the expiration of the punishment. When not so guaranteed it is sometimes made the subject of executive pledge. It has been held that an extradicted fugitive cannot be held in violation of such treaty or pledge to answer for any other offense than the one for which he had been surrendered. But in the absence of such treaty stipulation it has been held that there is no implied obligation to delay the arrest for such other offense. So it has been held to be no ground for releasing a prisoner who has escaped from the State into Canada and been forcibly brought back to the State, and there arrested without the assent of the Canadian authorities. In the case before us no treaty stipulation to guarantee a return is involved, and hence cases of international extradition arising under such treaties are not applicable. The interstate extradition clause of the Federal Constitution was never intended for the benefit of fugitives, nor to enable them to escape the just punishment of their offenses. * * * It was, in effect, a contract between the States upon a subject purely local, and as to which each would otherwise have been an independent sovereignty, that in case any person charged with crime in one State fled into another, such should, on demand of the executive of the former, cause him to be arrested and secured, if found therein, and delivered up to the agent of the former, to be removed to the State from which he had so fled It was, in effect, a pledge from every State to each of the others, incorporated into the organic law of the Nation, that it would become, to a certain extent, an agency in the administration of the laws of every other State against treason, felony or other crime as to all such criminals as should come within its borders."

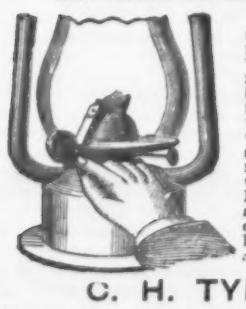
Comparative Naval Strength.—Great Britain still holds the first place with her armored fleet, says a German authority; France the second; Germany the third; Italy the fourth; Russia the fifth, and Austria the sixth. But at the present moment France is building 14 vessels of the most powerful model and eight armored vessels for coast defense. In four years France will have 30 war vessels, 12 of which will be of the first class, and England 32, only one of which will be of the same strength as any one of the 12 French ships. Italy is now building five first-class war vessels; Russia three and three ironclad cruisers; Germany one ironclad cruiser ond two gunboats; Austria one war vessel, and Denmark one ironclad for coast defense.

Acting Commissioner of Patents Dyrenforth has rendered an exhaustive decision upon the subject of trade-marks. He holds that a trade-mark is distinct from an invention, from copyright matter and from matter for print or label, and that trade-mark registration is distinct from registration for the purposes named. The distinction between copyright matter which goes to the Librarian of Congress and design matter is pointedly set forth in the decision.

The American Automatic Fire Alarm Association, of Boston, have just completed putting in nine of their electric watch clocks in the sardine factories at Eastport, Me.

CONTENTS.

LANTERN.



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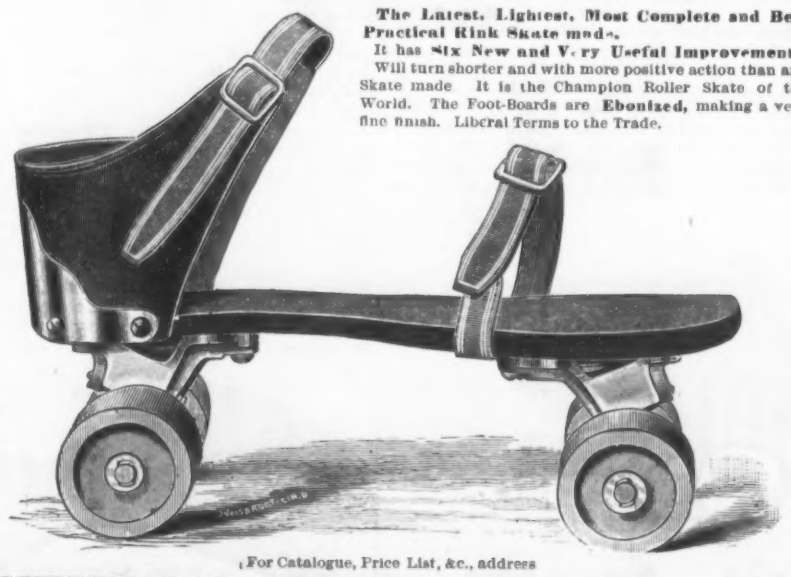

The Latest, Lightest, Most Complete and Best Practical Rink Skate made.

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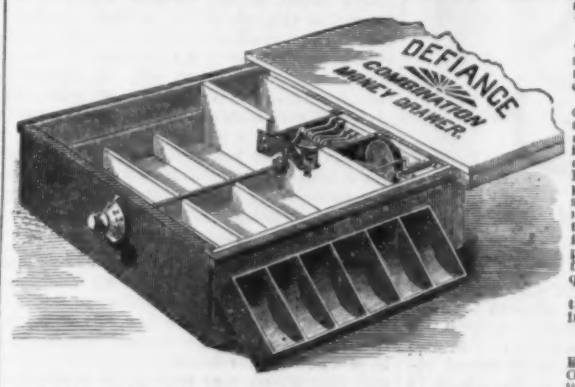

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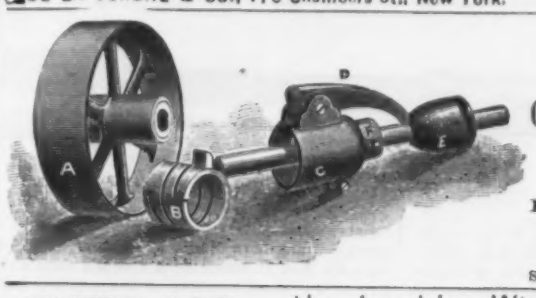

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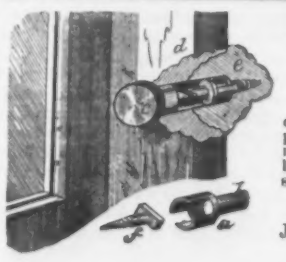

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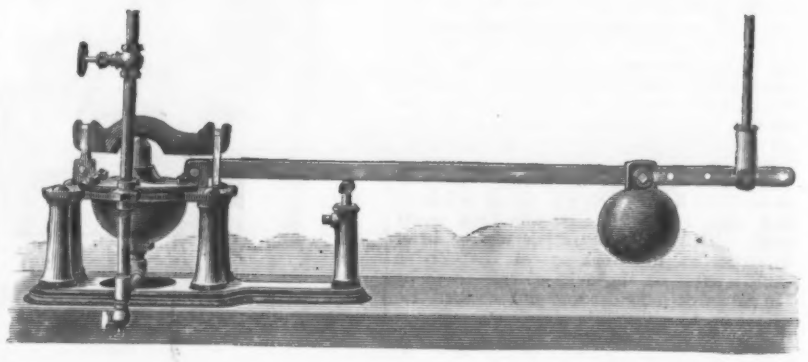

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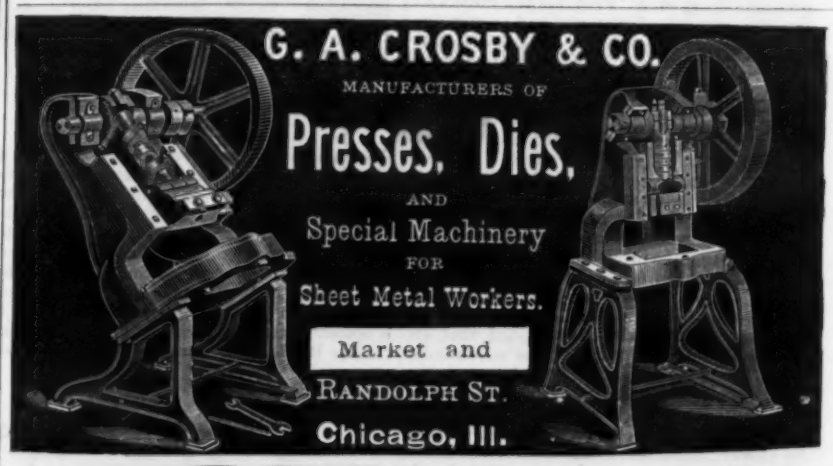

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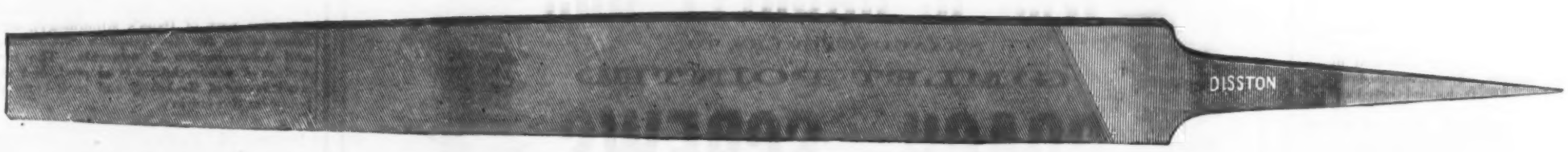

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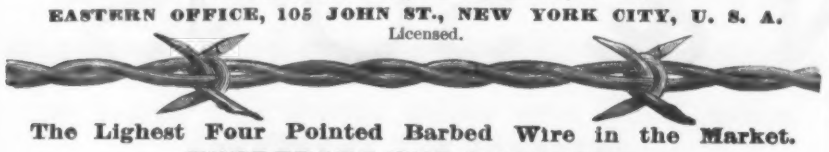

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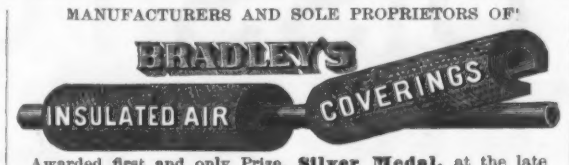

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This new handbook of general information for electrical students, operators and inspectors is the work of an experienced electrician and an author well known by his previous work on the telephone. The book is in the form of question and answer, and at the outset presents a general review of the theory and practice of electricity and magnetism in such a form that the subjects discussed may be readily understood by those of limited education. The different methods of generating the electrical current, electro-magnets, batteries and machines are described and illustrated. The subject of Telegraphy is particularly and thoroughly treated upon. Under this head there are chapters on the different systems, with principles involved in each—line construction, subterranean and submarine conductors, office wires and fittings and instruments, adjustment and care of instruments, circuit faults and their localization, and multiple telegraphs. Considerable attention has also been bestowed upon the miscellaneous applications of electricity, such as electric lighting, electric bells and the telephone, and there are brief remarks upon the use of the current as applied to the relieving of pain (electro-therapeutics), electric clocks, blasting, alarms, &c.

Du Moncel.—Electricity as a Motive Power. By Count Th. Du Moncel and Frank Geraldy. Translated from the French and edited, with additions, by C. J. Wharton; 113 illustrations, 316 pages, 12mo. cloth, 1883. . . . . $3

An introductory chapter to this volume explains the principles on which the construction of electric-motors is founded, the construction and laws of electro magnets, and the means employed to diminish the detrimental effects produced in electro-motors. Following this are several chapters devoted to a historical summary of the early attempts to obtain motive power by electricity, with descriptions and illustrations of the different early electro-motors and their special applications. The remainder of the book contains general remarks on modern motors and discusses at length recent applications and experiments, including applications of this force to railways, boats, cranes for hoisting purposes, elevators and other inventions. The different systems presented at the Paris Electrical Exhibition in 1881, and those shown at the recent exhibition at Munich, are discussed.

Fiske.—Electricity in Theory and Practice, or the Elements of Electrical Engineering. By Lieut. Bradley A. Fiske, U. S. N. 176 illustrations, 270 pages, 8vo, cloth; 1883. . . . . $2.50

In his preface, the author states that the design of this book is to form a bridge between the many works on the theory of electricity and those on its practical applications. Beginning at the very elements of the science with a chapter on magnetism, the different applications of the electrical current are treated upon and described. The illustrations, which are numerous and well executed, add greatly to the value of the work. The subjects treated upon in different chapters are frictional electricity; work and potential; voltaic batteries; laws of currents; secondary or storage batteries; thermo-electric batteries; electro-magnetism; induction currents; electrical measurements; telegraphy; the telephone; the electric light; electric machines; electro-motors; electric distribution of power; meters and electric railways.

The book will prove interesting to students, and equally so to engineers, as containing within its covers a large amount of practical information upon electricity and its applications, together with the latest results and inventions pertaining to electrical engineering.

Ferguson, Robert M., Ph. D.—Electricity. New edition, revised and extended by James Blyth; fully illustrated, 12mo, cloth. London, 1883 . . . $1.50

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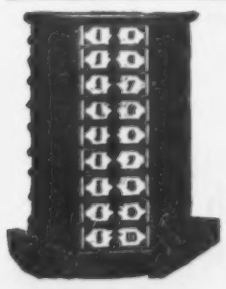

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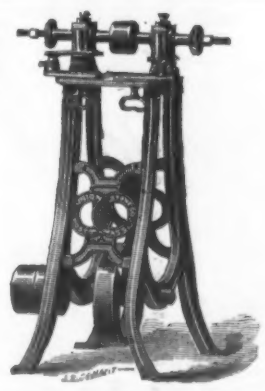

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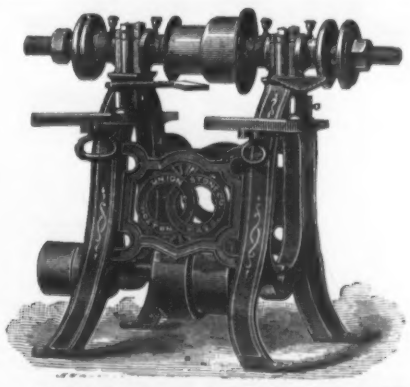

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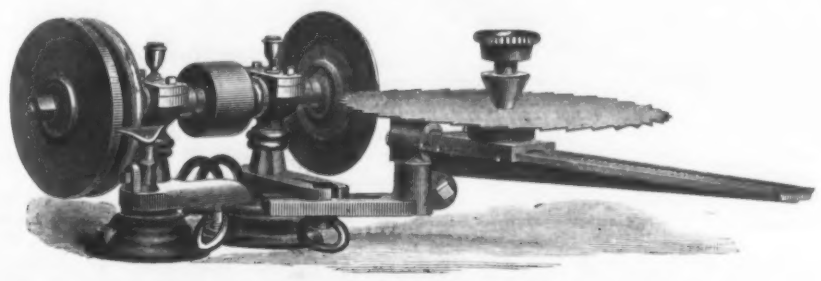

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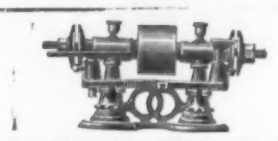

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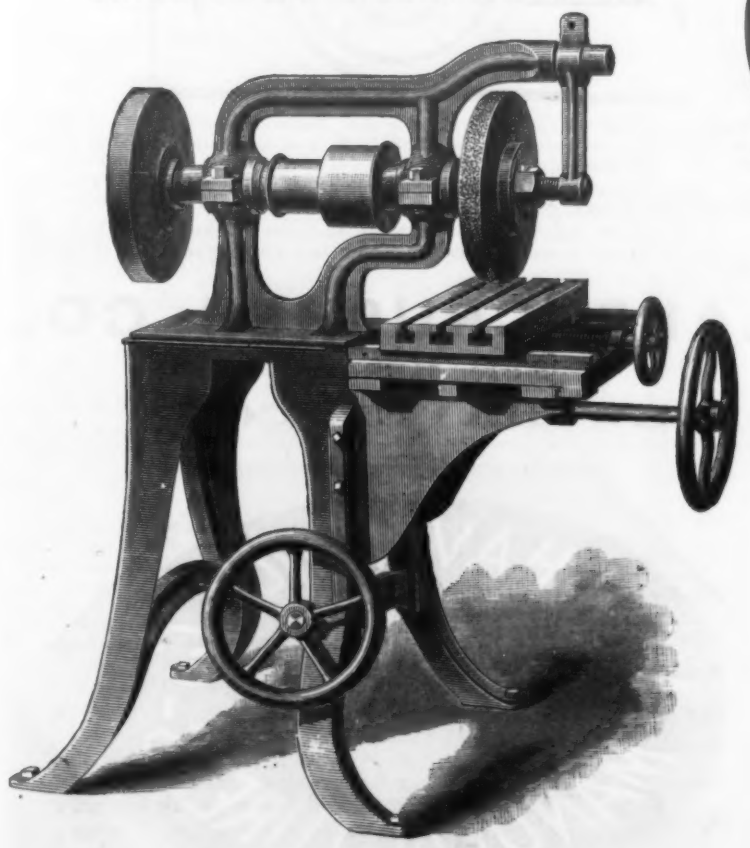

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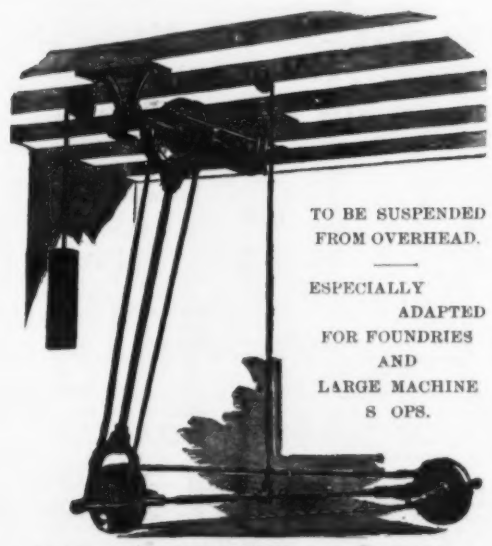

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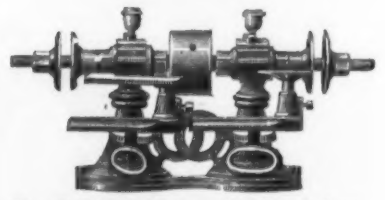

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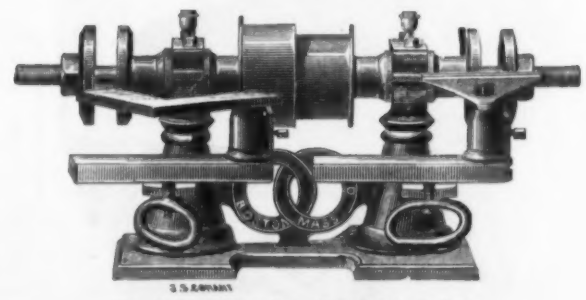

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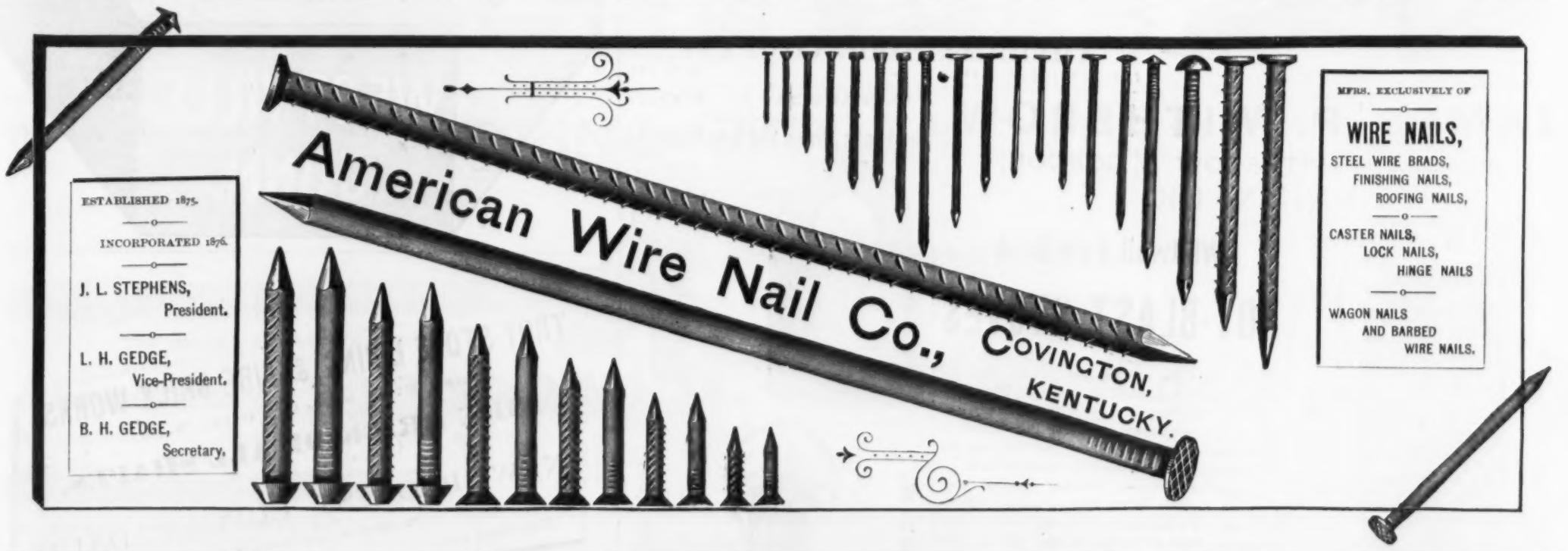

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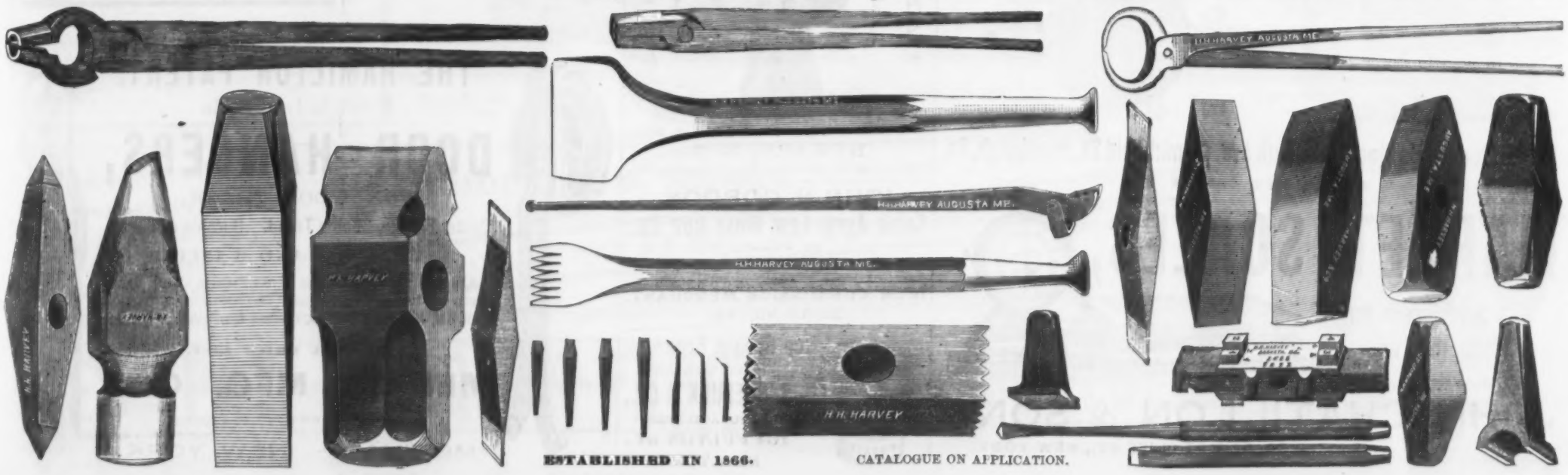

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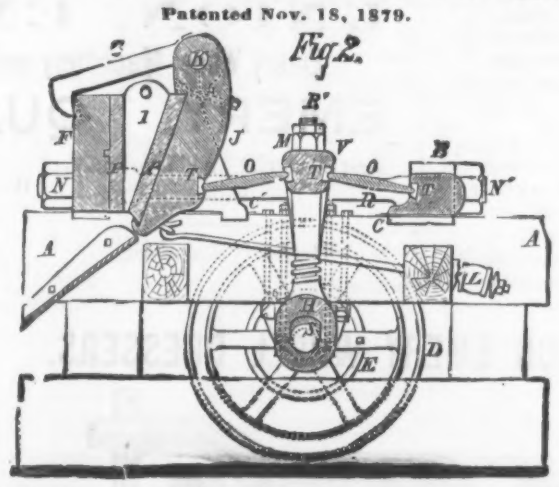

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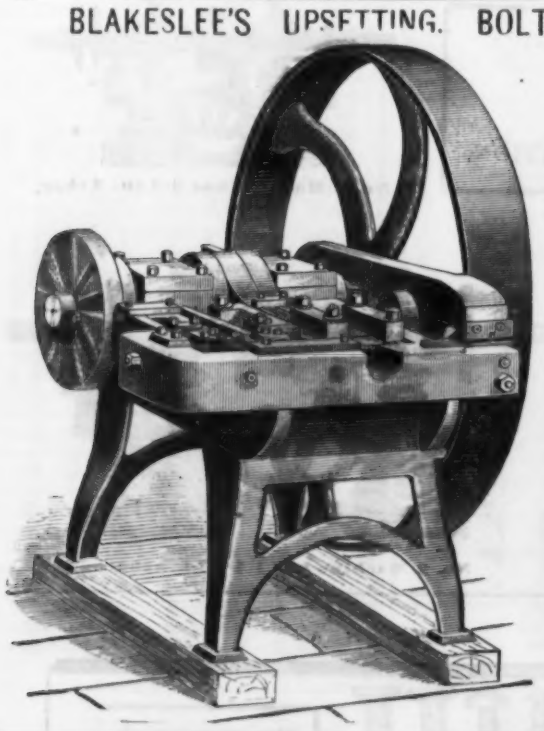

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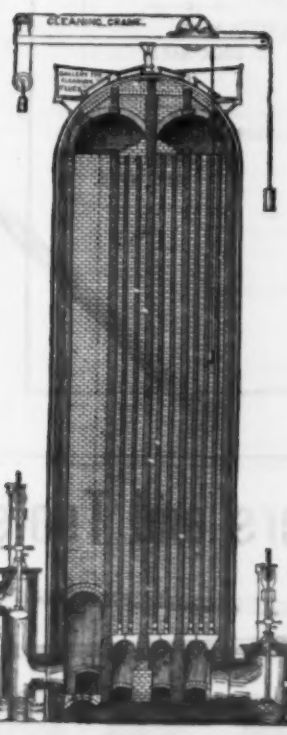

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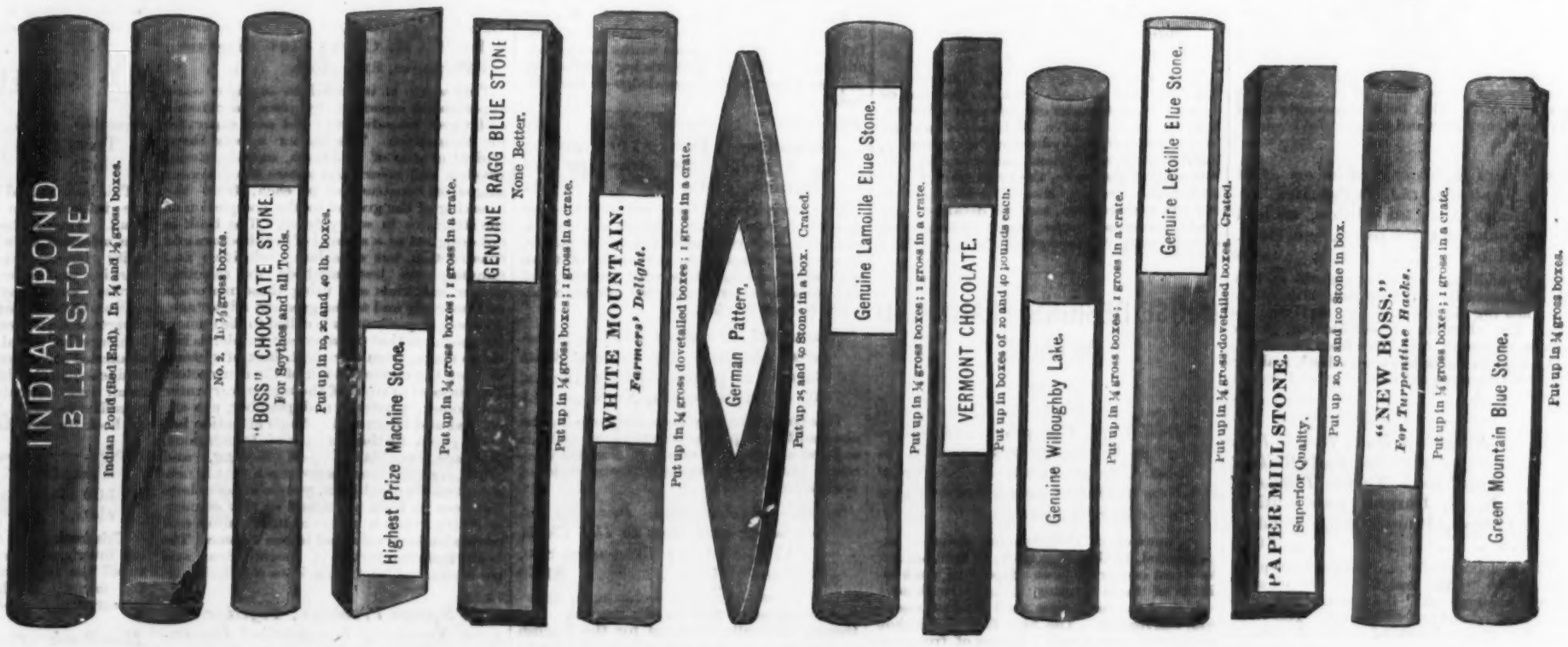

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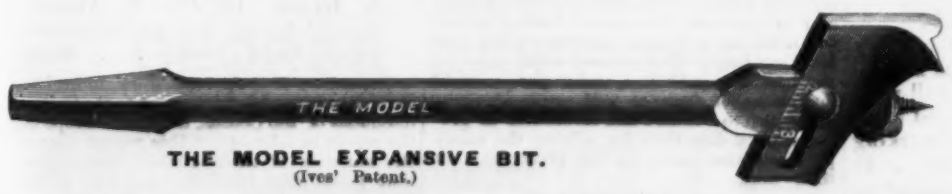

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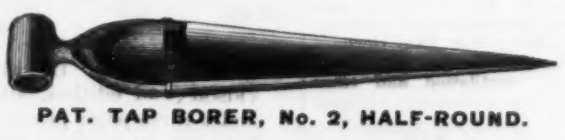

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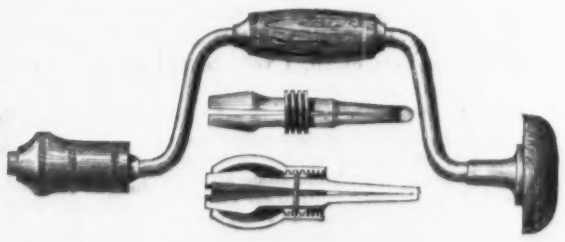

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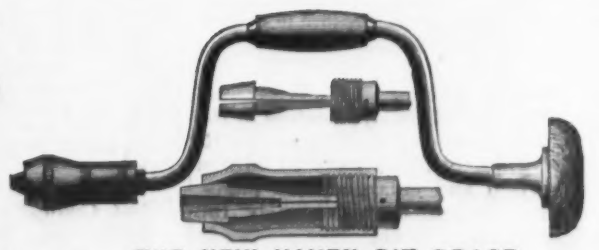

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The author of the present work, in his letter transmitting his final report to the Superintendent of the Census, states the scope of the report as follows: "This report covers the statistics of those establishments only that make glass from the sand, or works having furnaces and pots in which the glass was melted and made into the various forms of plate and window glass, glassware and green glass. It does not include the statistics of any staining, cutting, engraving, drawing or spinning of glass, or any other process of reworking glass, except in the case of establishments that cut and engrave in connection with the manufacture of the glass from the sand." The book is divided into twelve chapters. Chapter I is devoted to Statistics, including establishments in which glass was made in 1880, plant of factories, amount of capital employed, employees, wages paid, production, and complete tables of the plate-glass, window-glass, glassware and green-glass works of the United States at the census of 1880. The remainder, and the bulk of the work, is a detailed treatise upon the manufacture and history of glass. The chapter headings are as follows: Glass—Its Composition, Classification and Properties; Sand; Alkalies and Other Materials; Glass Furnaces and Pots; Mixing, Melting, Fining and Faults; Glass-Working; History of Some Processes of Glass-Making; Ancient Glass; Modern Glass; the Present Condition of Glass-Making in Europe; History of Glass-Making in the United States. Aside from the valuable compilation of statistics and facts presented, this report shows, on the part of the author, careful study and preparation and a thorough knowledge of the subject.

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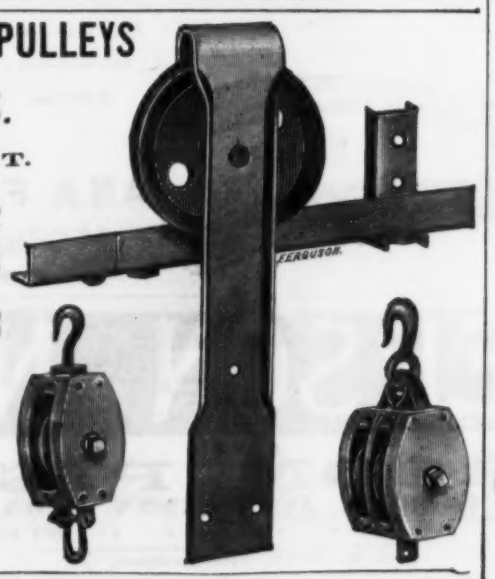

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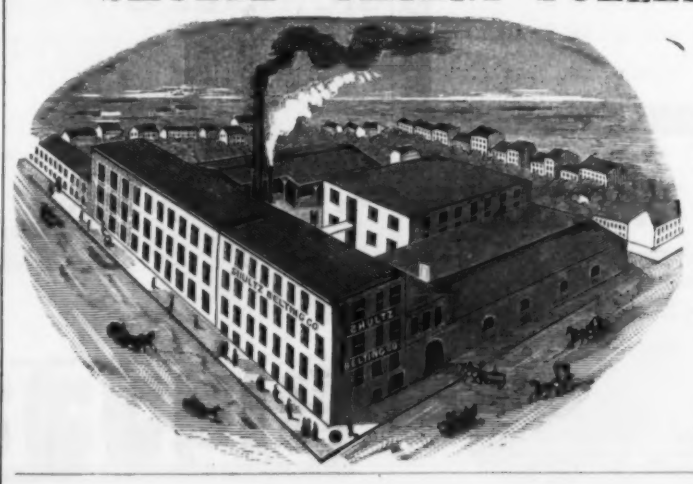

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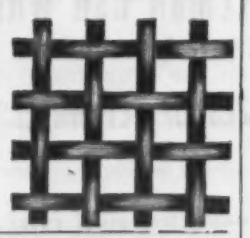

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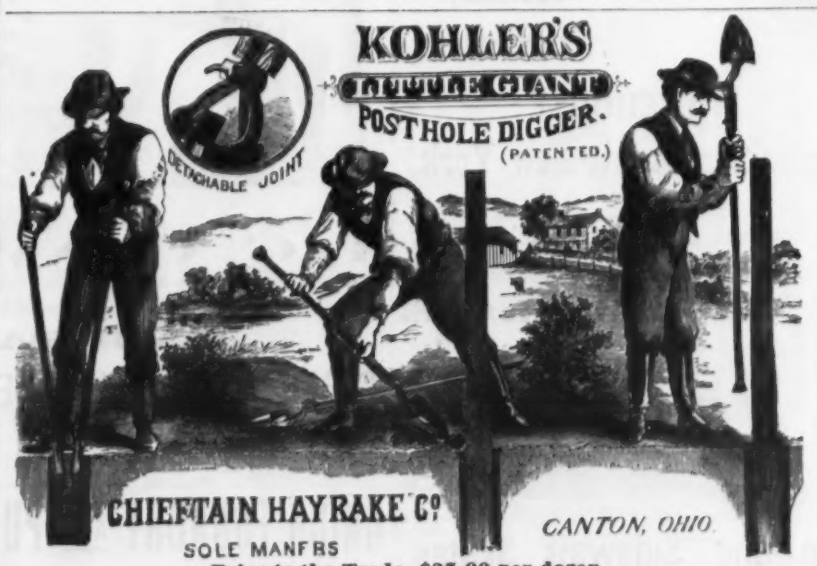

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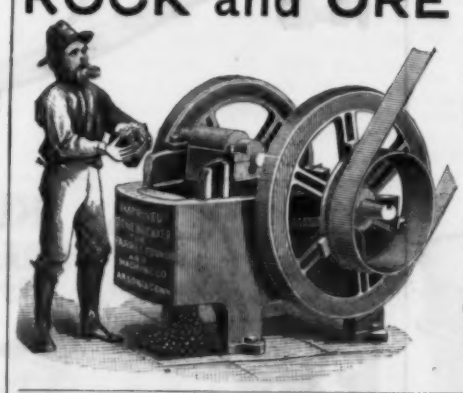

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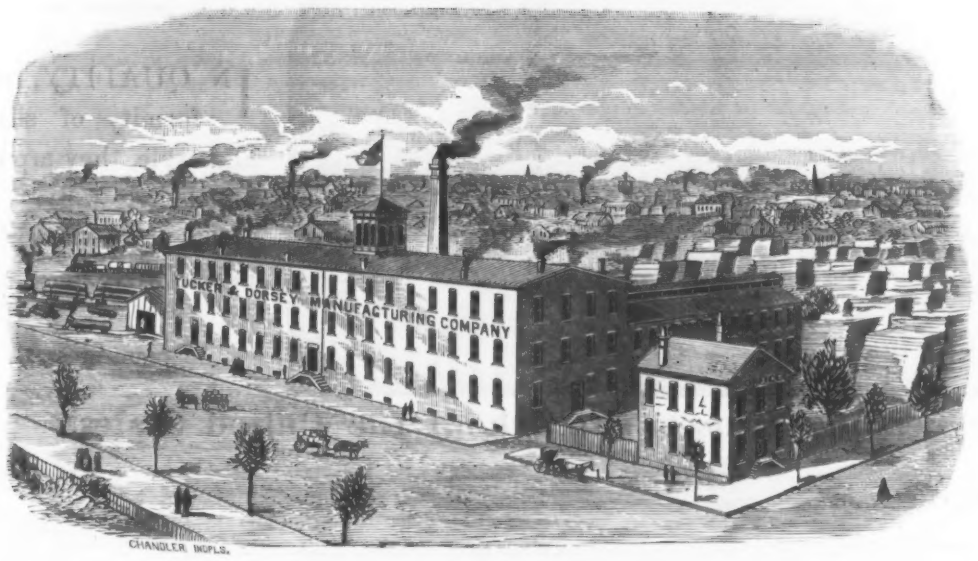

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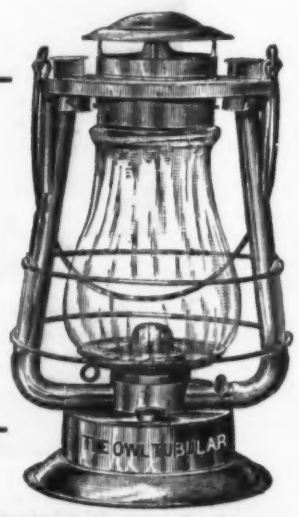

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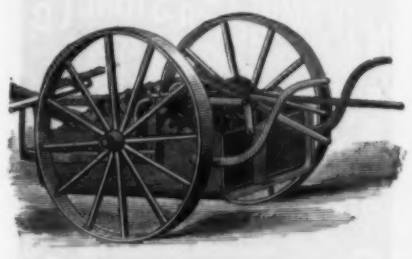

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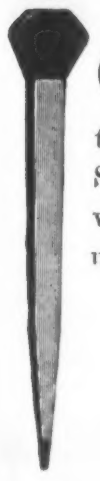

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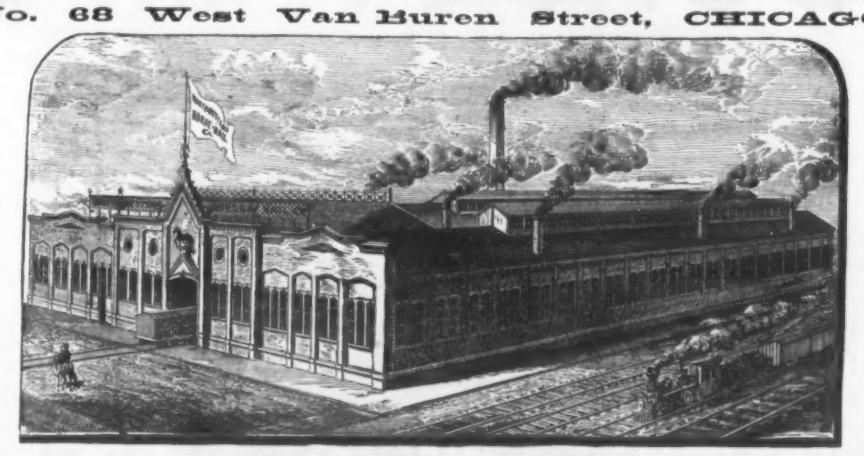

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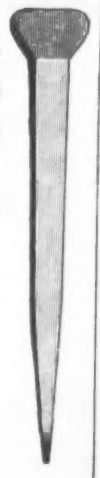

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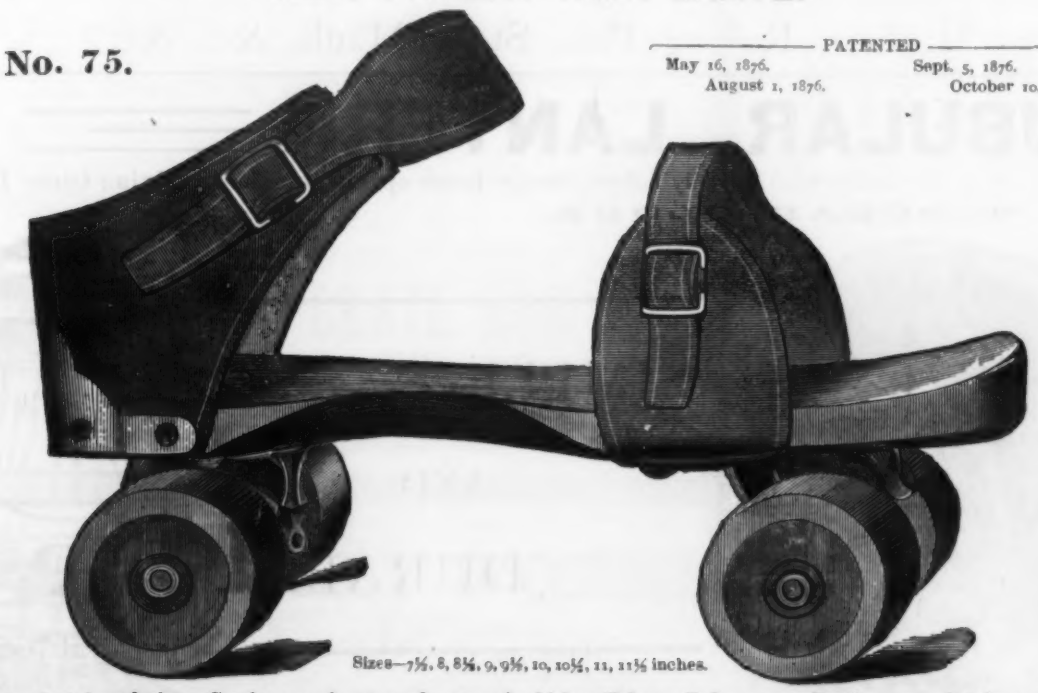

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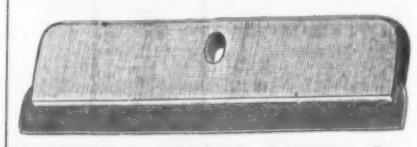

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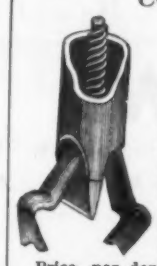

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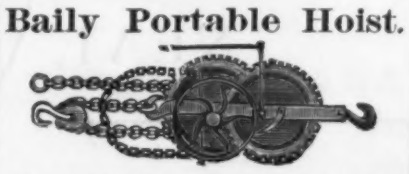

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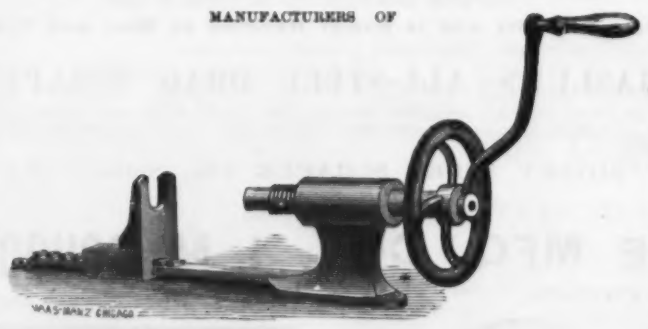

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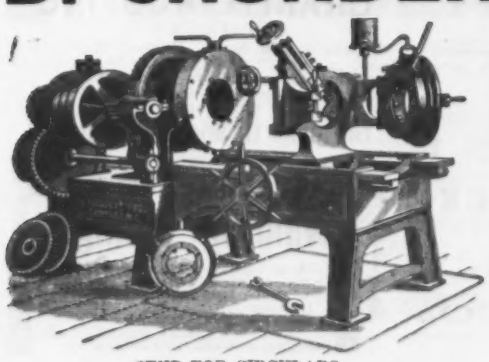

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G H K, of Fig. 426, is presented one of the sets of conditions which necessitate a change of profile, in either the horizontal or raking molding, in order to accomplish a miter joint at the point indicated by I H in the plan. In other words, the conditions are such that with a given profile, as shown by A^1 in the raking molding, the horizontal molding forming the return will require to be modified, as shown by the profile A^2, in order to form a miter upon the line I H in the plan; or, if A^2 is established, A^1 will have to be constructed to correspond with A^2. The reason for this is quite obvious. The distance across the raking molding at right angles to its lines is greater than the corresponding distance across the return molding at right angles to its lines; therefore the projection in the cornice, as shown by the profile A^2, must be distributed through a smaller space than is shown in the profile A^1. In this problem we assume that the pitch of the raking cornice B C is established and that the profile A is given, and from these parts it is required to develop the modified profile. We have the choice of placing the normal profile in the horizontal return and making the raking profile correspond with it, or of placing the normal profile in the raking molding and making the profile of the horizontal molding agree with it. Although the principle upon which these operations is performed is identical in both, the demonstration will be made clearer if each is fully illustrated independent of the other. In this problem and the following one, therefore, we show the several steps necessary to take in modifying the profile, and in cutting the several patterns required to form the structure indicated by the elevation and plan. First we will assume that the normal profile occurs in the raking cornice, and that the horizontal profile is to be modified to suit it. We then proceed as follows: Draw a representation of the normal profile in the raking cornice, as shown by A^1, placing it to correspond to the lines of the cornice, as shown. Draw another profile corresponding to it in all parts, directly above or below the foot of the raking cornice, in line with the face of the new profile to be constructed, placing this profile A so that it shall correspond with the lines of the horizontal cornice. Divide the profiles A and A^1 into the same number of parts, and through the points thus obtained draw lines, those from A^1 being parallel to the lines of the raking cornice, and those from A intersecting them vertically. Through these points of intersection trace a line, which gives the modified profile, as shown by A^2. Then A^2 is the profile of the horizontal return, indicated by G H I F in the plan. It is also the elevation of the miter line I H of the plan for the several patterns involved. We therefore proceed as follows: At any convenient point at right angles to the lines of the raking cornice lay off the stretchout M N of the profile A^1, through the points in which draw measuring lines in the usual manner. Place the T-square at right angles to the lines of the raking cornice, and,

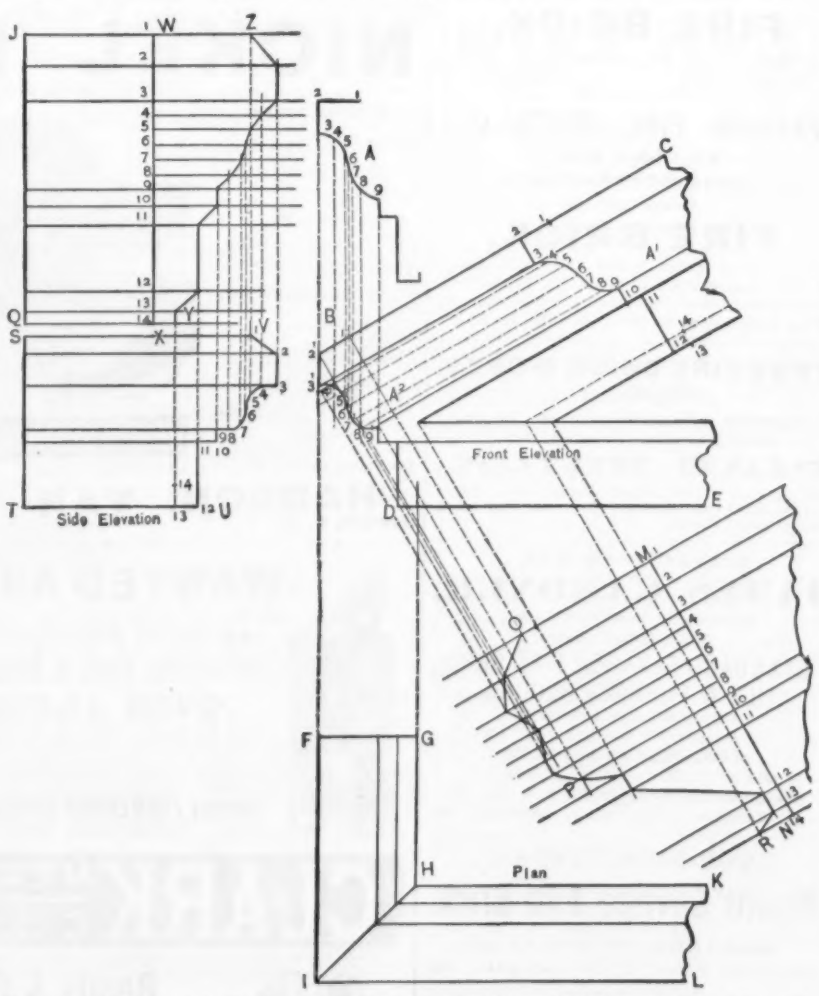

Fig. 426.—To Ascertain the Profile of a Horizontal Molding Adapted to Miter with a Given Inclined Molding at Right Angles in Plan, and the Several Miter Patterns Involved.

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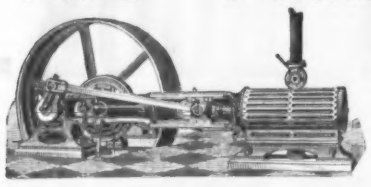

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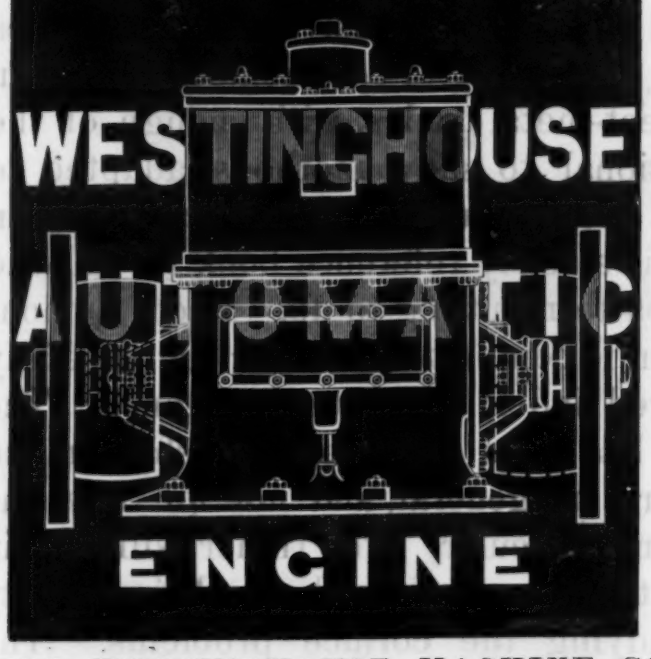

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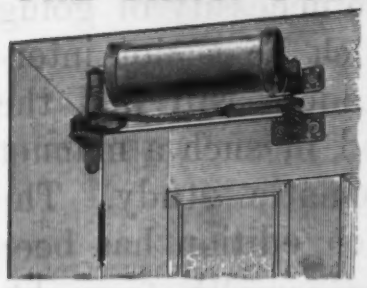

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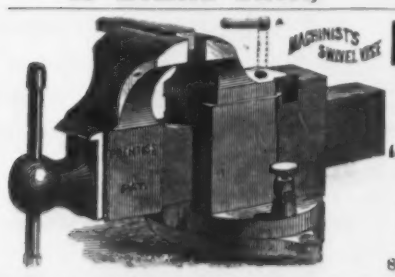

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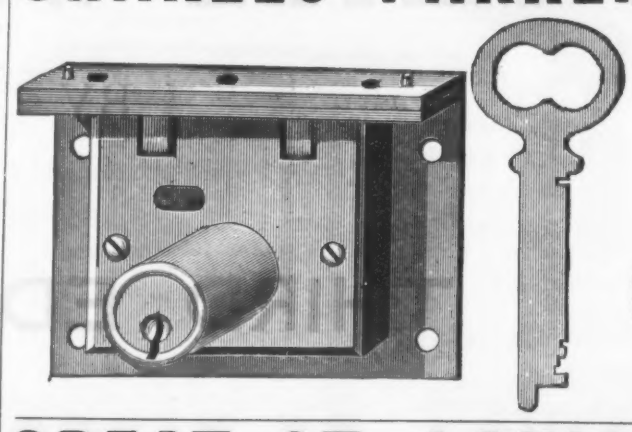

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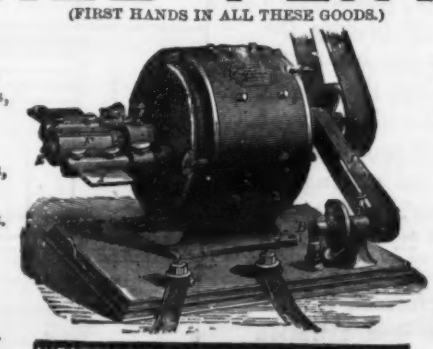

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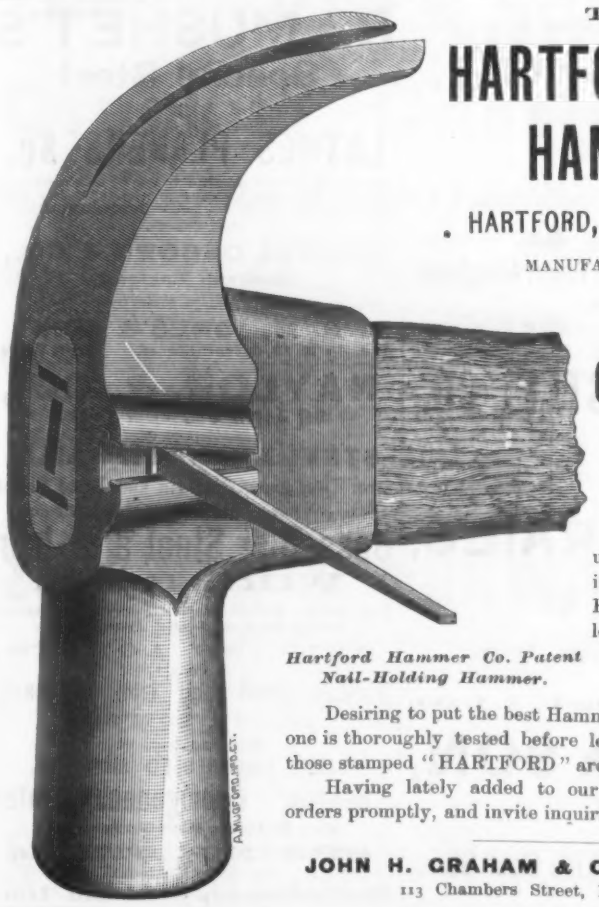

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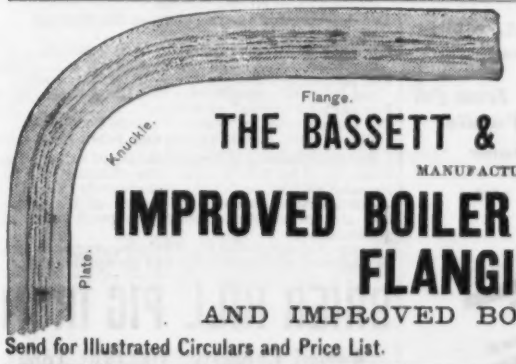

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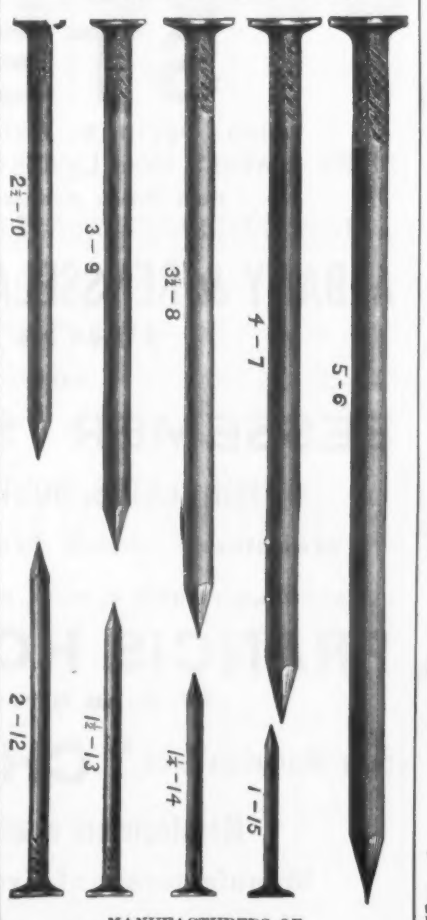

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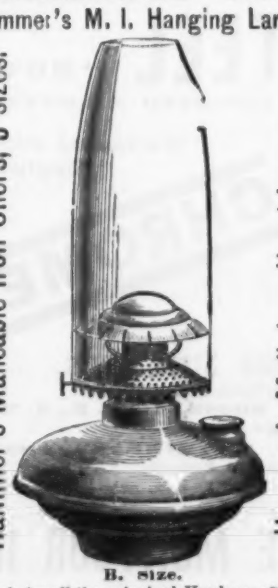

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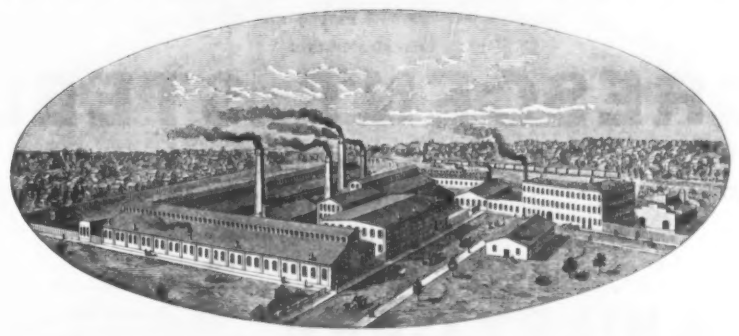

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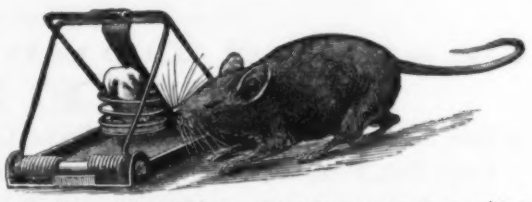

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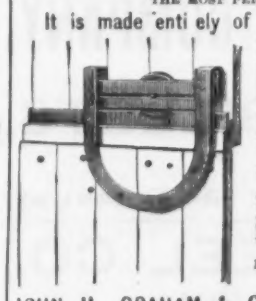

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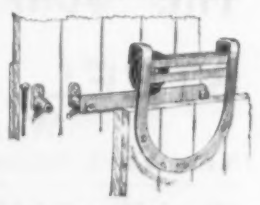

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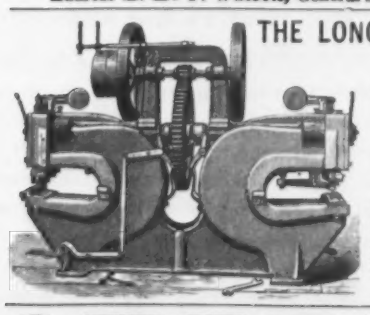

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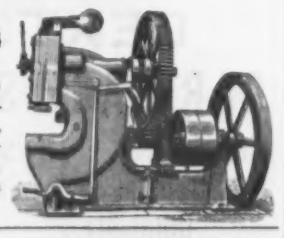

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Ironmonger Diary and Text Book for 1885

(now in course of preparation) as complete a list as possible of trade-marks, brands, specialties, &c., made and in use in all parts of the world, similar to that contained in our Diary for 1884.

This list excludes all ordinary trade announcements proper, and is strictly confined to trade-marks and brands, whether blocks, electros or other appliances for illustrations, with just sufficient letter-press to describe the kind of article to which the mark, &c., is applied, and the names and addresses of the owners or lawful users. For the sake of uniformity in space and charges, each mark occupies a space measuring 1 inch deep by $1\frac{1}{2}$ inches wide, and the uniform charge is $2.50 (10s.) only for each such space, payable in advance unless we have already an open advertising account with the firm giving the order.

The advertisements so inserted are printed on colored paper, **classified under suitable heads,** and so arranged as to make them both effective and useful.

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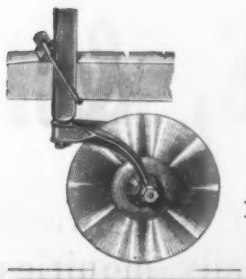

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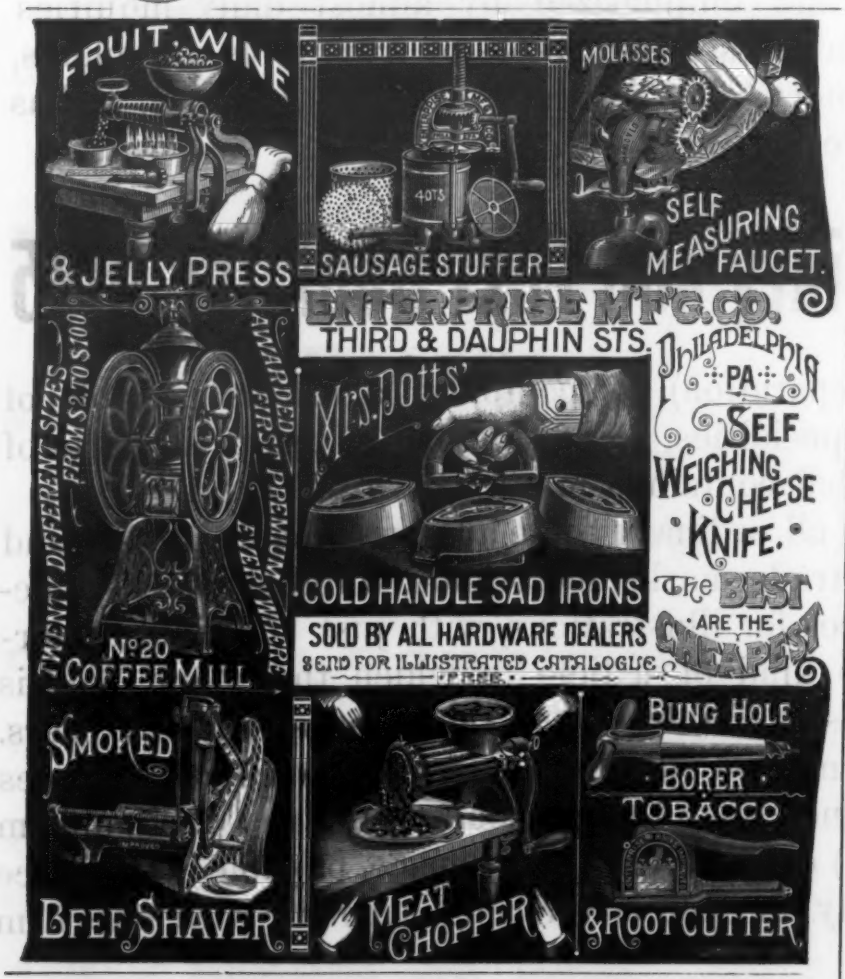

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Cog Chain

For a Sash of 250 Lbs.

JOHN T. LEWIS & BROS.,

No. 231 South Front St.,

PHILADELPHIA.

JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil,

AND PAINTERS' COLORS.

JOHN JEWETT & SONS

Manufacturers of the well-known brand of

WHITE LEAD.

JEWETT & SONS' PERFECTLY PURE WHITE LEAD.

TRADE MARK.

ALSO MANUFACTURERS OF

LINSEED OIL.

181 Front Street, NEW YORK.

ATLANTIC WHITE LEAD WARRANTED PURE ROBERT COLGATE & Co. TRADE MARK

The Atlantic White Lead and Linseed Oil Co.,

Manufacturers of

White Lead (Atlantic), Red Lead, Litharge, Glass Makers' Litharge and Orange Mineral;

LINSEED OIL.

Raw, Refined and Boiled.

ROBERT COLGATE & CO.,

287 Pearl St., NEW YORK.

SALEM LEAD COMPANY,

CORRODERS AND MANUFACTURERS OF

PURE WHITE LEAD.

SALEM LEAD CO. 100 WARRANTED PURE SALEM, MASS.

ALSO MANUFACTURERS OF

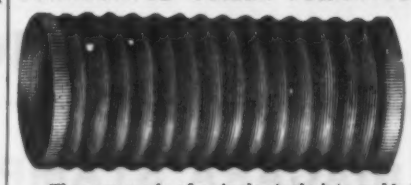
Lead Pipe and Narrow Sheet Lead.

SALEM, MASS.

F. A. BROWN, Treas.

FOX'S

CORRUGATED BOILER FURNACES.



1. They are made of a single steel plate, welded at the bottom, with no joint in contact with the flame.

2. They give 30 per cent. more evaporative power.

3. They throw off all scale by their elasticity.

4. They do not destroy themselves by the variation of temperature, contracting and expanding as they do like an accordeon. They have not enough stiffness to work against the boiler heads.

5. They require, to comply with the rules of the Board of Trade in England, only *one-half* the thickness of plate of plain furnaces for equal working pressure.

6. Where a plain furnace of equal length, diameter and thickness collapsed at 225 pounds, the Corrugated stood 1050 pounds per square inch.

Since five years 700 steamers were fitted with these furnaces, among them the Alaska, Oregon, City of Rome, Servia, Elbe, Werra, Fulda, &c.

Perfect safety and greatest economy combined.

For particulars, apply to

Hartmann, Le Doux & Maecker,

134 PEARL ST., NEW YORK,

Sole Agents and Assignees of U. S. Patents.

Prouty's Patent

PEERLESS FORCE PUMP.

Has Self-Adjustable Foot Rest.

NEW AUTOMATIC COMPENSATING PACKING.

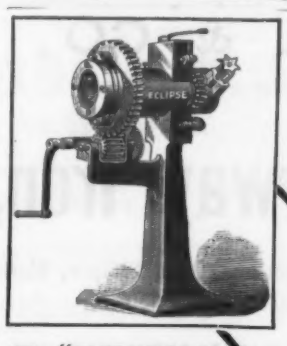
It will throw a continuous jet FROM FORTY TO SIXTY FEET. A new pattern jet and spray nozzle is sent with each pump.

Especial attention is called to the material and workmanship exhibited in these pumps.

THE NEW ENGLAND BUTT CO.

PROVIDENCE, R. I.

NEW YORK OFFICE, 99 Chambers St.



THE "ECLIPSE" HAND

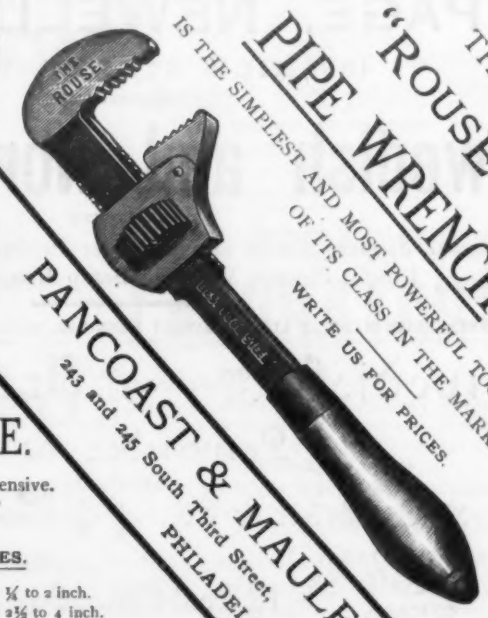
PIPE MACHINE.

Simple, powerful, portable, inexpensive. With it one man can easily cut 6-inch Pipe.

MADE IN THREE SIZES.

No. 1.—CUTS AND THREADS ¼ to 2 inch.
No. 2.—CUTS AND THREADS 2½ to 4 inch.
No. 3.—CUTS AND THREADS 2½ to 6 inch.

SEND FOR CIRCULAR AND PRICES.



THE "ROUSE" PIPE WRENCH

IS THE SIMPLEST AND MOST POWERFUL TOOL OF ITS CLASS IN THE MARKET.

WRITE US FOR PRICES.

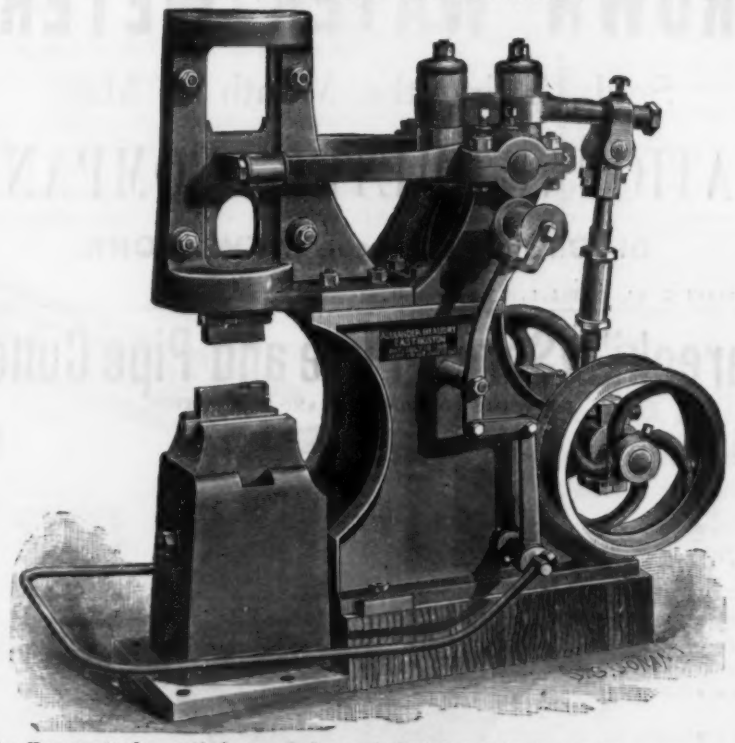
PANCOAST & MAULE,

243 and 245 South Third Street,

PHILADELPHIA.

BEAUDRY'S UPRIGHT POWER HAMMER.

SIMPLE, PRACTICAL AND LOW-PRICED.



This Hammer is of an entirely new design, and adapted to all kinds of work. It strikes a direct upright blow, and is given with the same elasticity as by a blacksmith's arm and thus does not chill the work.

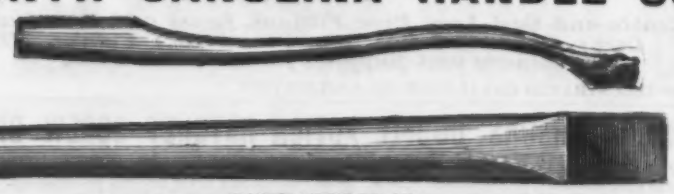
ALEXANDER BEAUDRY, 150 Portland St., Boston, Mass.

For full Description and Testimonials, send for Circular.

V. G. HUNDLEY,

PROPRIETOR OF

NORTH CAROLINA HANDLE CO.



MANUFACTURER OF

Handles and Spokes,

79 Reade Street and 97 Chambers Street, - - - NEW YORK.

HARDWARE COMMISSION MERCHANT.

SHEET-IRON BUILDING MATERIALS.

ROOFING. — Patent Cap Seam Roofing, in Four Styles. In Sheets or Rolls.

SIDING. — Crimped Iron, for Siding or Roofing for Elevators, Mills and Factories.

CEILING. — Paneled and Crimped Iron Ceiling. Durable, Attractive, Fire-proof.

Send for Prices and Circulars to

A. NORTHROP & CO., 97 First Ave., PITTSBURGH.

PHILADELPHIA.

Lloyd & Supplee Hardware Co.

erms, 30 days. For 60 or 90 days, interest added at 8 per cent. per annum.

Anvils.
Peter Wright's, ℘ ℔ ... 10¾ @ 11 ¢
Over 200 ℔ ... 11 ¢
Trenton ... 9¾¢
Eagle Anvils, American, 10¢ ... dis. 20 %

Apple Parers.
Globe Apple Parers ... $5.50 net
Penn Apple Parers ... 5.50 net
White Mountain ... 5.50
Lots of 10 to 25 dozen, special prices.

Axes.
Hunt's Kentucky and Yankee, ℘ doz. net ... $7.25
Robert Mann, ℘ doz. net ... 7.25
Richland Chief ... 7.25
Beveled Axes ... add 50¢
Double Bit Axes, net ... $12.00

Augers and Auger Bits.—New List, January 7, 1880.
Bates' Nut Augers ... dis 60 %
Cook's Augers ... dis. 40&10&10 %
Watrous' Ship Augers ... dis. 15 %
Benjamin Pierce Auger Bits ... dis. 40 %
New Haven Copper Company ... dis 60 %
Snell's Augers and Bits ... dis 60 %
Snell's Ship Augers ... dis 15 %
Cook's Auger Bits ... dis. 40&10&10 %
Jennings' Auger Bits, new list, Jan. 1, 1884..dis.. 25 %
Bonney's Pat. Hol. Augers, list $48 ℘ doz ... dis. 40 %
Stearns' Pat. Hol. Augers, list $48 ℘ doz ... dis. 20&10 %

Balances.
Light and Common ... dis. 40 %

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells.dis. 70&10 @ ... 75&10 %
Swiss Pattern Hand Bells ... 60 %
Connell's Door Bells ... dis. 15&10 %
Gt. Western & Kentucky Cow, new list ... dis. 70 %

Boring Machines
Upright, without Augers ... List, $5.50 } dis ... 50&5 %
Angular, without Augers ... List, 6.75 }

Bolts.—Eastern Carriage Bolts, new list, June 10, 1884 ... dis. 75 @ 75&5 %
Philadelphia Carriage Bolts ... new list, dis. 70&10 %
Stanley, Wrought Shutter ... dis. 50&10 %

Braces.—Barber's ... dis. 40&5 %
Backus ... dis. 50&5 %
Spofford ... dis. 50&5 %
American Ball ... dis. 55 %

Butts.—Cast Fast Joint, Narrow ... dis. 40&10&10 %
Cast Fast Joint, Broad ... dis. 40&10&10 %
Cast Loose Joint, Narrow ... dis. 60&10 %
Cast Loose Joint, Broad ... dis. 60&10 %
Cast Acorn, Loose Pin ... dis. 60&10 %
Cast Acorn, Japanned ... dis. 60&10 %
Cast Mayer's Loose Joint ... dis. 60&10 %
Wrought Loose Pin ... dis. 60&2½ @ 60&2½& 10 %
Wrought Table Hinges and Back Flaps..dis. 55&10 @ 55&10&10 %
Wrought Narrow Fast ... dis. 55&&10 @ 55&10&10 %
Wrought Loose Joint ... dis. 60&2½ @ 60&2½&10 %

Blind Butts.
Parker ... dis. 70&2 %
Clark ... dis. 75 %
Shepard ... dis. 75 %
Lull & Porter ... dis. 75&10 %
Huffer's ... dis. 50 %

Casters.—Bed (new list July 1, 1880) ... dis 50@55 %
Plate ... dis 50 @ 55 %

Chains.—German Halter and Coil, list June, 1884 ... dis. 50 @ 55 %
Galvanized Pump ... ℘ ℔ 7¢ net
Best Proof Coil Chain—English.

℘ ℔	12	8½	7¼	6¾	6	5¾ gold.
	3-16	¼	5-16	⅜	7-16	½ in.

Chisels.—Socket Framing ... dis 70&10 %
Socket Firmer ... dis 70&10 %
Butcher's ... $5.00@$5.25 to £ gold

Coffee Mills.—Box and Side (new list Jan. 1, 1880) ... dis 50 %
Enterprise ... dis 20&10 %

Cutlery.—Walden Pocket ... new list net
Pennsylvania Knife Co ... new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Drawing Knives.
Hart Mfg. Co.'s ... dis 70&10 %
Adjustable Handle ... dis 20 %

Fry Pans.
Tinned ... dis 45 %

℘ doz ...	$3.50	4.00	4.50	5.00	5.50	6.50	7.50	9.00	10.00
No. ...	0	1	2	3	4	5	6	7	8

Burnished ... dis. 60&10&10 %

℘ doz ...	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
No. ...	0	1	2	3	4	5	6	7	8

Files.
Nicholson ... dis 50&10 %
Disston ... dis 50&10 %
Butcher ...

Fluting Machines.
Eagle—3½ in. roll ... each, $2.15 } dis 35 %
Eagle—5½ in. roll ... each, 2.85 }
Crown—4½ in. roll ... each, 3.50 }
Crown—6 in. roll ... each, 4.00 } dis 35 %
Crown—8 in. roll ... each, 6.50 }
Geneva Fluter ... dis 25 %
Favorite com. Fluter and Sad Iron..℘ doz., $10.50 net

Hammers.
Yerkes & Plumb's, new list ... dis 30 %
Maydole Hammers ... dis 15 %
Howell A. E. Nail Hammers ... ℘ doz., net $3.75

Handles.
Disston Loop Handles Cross-Cut ... 33¢ pair net
Boynton Loop Handles Cross-Cut ... 33¢ pair net

Hatchets.
Yerkes & Plumb, new list ... dis 40 %
Hunt ... dis 35 %

Hinges.
Strap and T ... dis 60, 10, 10&2 @ 70 %

Horse Nails. Nos.	5	6	7	8	9	10	
Globe	26	23	21	20	19	18	dis 10&5 %
Vulcan	26	23	21	20	19	18	dis 12½ %
Ausable	30	27	25	24	23	22	dis 25&10 %
" Pol'ed and P't'd & Blued & P't'd	31	28	26	25	24	23	dis 25&10 %
Clinton		23	21	20	19	18	dis 25&10 %
" Pol'ed & P't'd.		24	22	21	20	19	dis 25&10 %
Saranac	26	23	21	20	19	18	..dis 20 %

Hay and Straw Knives.
Lightning ... ℘ doz., net $18.00
Electric ... ℘ doz., net 18.00
Wadsworth ... ℘ doz., net 10.50
Walton Straw Knives ... ℘ doz., net 17.00

Locks and Knobs.
Gaylord Cabinet ... dis 45&2 %
Parker's Cabinet ... dis 45&2 %
American Padlocks ... dis 45&2 % cash
Scandinavian Padlocks ... dis 50 %

℘ doz.	$5.00	5.50	6.50	7.50	8.50	10.00	12.50	dis 60 %
No.	57	58	59	60	61	62	63	
℘ doz	$18.00		26.00		33.00			dis 60 %
No.	64		65		66			

Lanterns.
Buckeye ... large list, net; small list, net
Tubular ... No. 0, $7.50; No. 1, $9.00 ℘ doz. net
Guards, 40¢ extra.

Lawn Mowers.—Pennsylvania ... } new list,
Philadelphia ... } dis 30&5
Excelsior ... } &3 %

Lawn and Garden Pumps.
Holland Patent ... list, $5.00, dis 10 %

Mattocks.
Long and Short Cutter ... new list, 50&10 %
Pennsylvania Pattern ... dis 50&10 %

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.dis. 20&10 %
Stebbins' Gates ... dis. 70&10 %
Lincoln's Gates ... dis. 60&10 %
Landers, Frary & Clark's Petroleum..dis.35&5 @ 40 %
Brass Liquor Cocks, new list Jan. 1, 1880 ... dis. 60 %
Cork Lined Cocks ... dis. 70 %

Meat Cutters.
Dixon's ... dis. 40 %
Woodruff ... dis. 40 %
Stowe ... dis. 40 %
Hale's ... new list, dis. 60, 10&2 cash
American ... dis 40 %
Stuffers ... dis. 40 %
Enterprise Stuffers ... dis. 25 %

Planes.—Sandusky Tool Co ... dis. 20 %
Ogonts ... dis. 25 %
Ohio and Auburn ... dis. 20 %
Bailey (S. R. & L. Co.) ... dis. 20&10 %

Plane Irons.—Ohio Tool Co ... dis. 20&10 %
Butcher's ... $5.00 @ 5.25 to £

Plumbs and Levels.
Stanley's Adjustable ... dis. 65&10 %
Stanley's Non-Adjustable ... dis. 65&10 %

Picks.—New list ... 50&10 %

Razor Strops.
Lamont Combination ... ℘ doz. $4.00
Lamont Combination ... 1 gross lots $42.00
Imitation Emerson ... ℘ doz. $2.00

Rules.—Stanley Boxwood ... dis. 75 & 10 %
Stanley Ivory ... dis. 55 %

Steelyards.—Hart's Pattern ... dis. 40 %

Per doz ...	$14.50	17.75	21.00	26.50	31.00	35.50
Lbs ...	50	100	150	200	250	300

American Pattern ... dis. 40 %

Per doz ...	$8.00	10.25	13.75	15.60	16.75	19.50
Lbs ...	50	100	150	200	250	300

Scale Beams ... 55@60 %
Custers ... 25 %

Squares.
Steel and Iron.dis. 50; full case..dis. 50&10&2 for cash
Try Squares, Stanley ... dis 55&10 %
Disston's Try Squares ... dis 40 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ... ℘ doz $9.00 }
Clipper No. 10, Bronzed Blade, Boxed and Sharpened ... ℘ doz $8.50 } 30
Clipper No. 5, Painted Red, Boxed and Sharpened ... ℘ doz $8.00 }

Saws.—Disston's Hand, Panel and Rip ... dis 20&10 %
Disston's Circular ... dis 45&10 %
Cross-Cut No. 2, Plain Tooth ... dis 45&10 %
Cross-Cut Patent Tooth ... dis 45&10 %
Cross-Cut Champion Tooth ... dis 45&10 %

Shovels and Spades.
Oliver Ames & Sons, new list ... dis 17½ %
Griffiths ... dis 50 @ 50&10
Rowland ... dis 50 @ 50&10

Sad Irons.—4 to 10 ℔ ... ℘ ℔ 2¾ @ 3¢
Mrs. Potts' Patent ... dis 35 %

Stone.
Washita Extra ... ℘ ℔ 23½¢
Washita No. 1 ... ℘ ℔ 16¢
Washita No. 2 ... ℘ ℔ 13¢
Washita Slips ... ℘ ℔ 36¢
Washita Axe ... ℘ ℔ 13¢ net
Hindostan Oil Stone No. 1 ... ℘ ℔ 6¢ }
Hindostan Axe Stone ... ℘ ℔ 8¢ } dis 40 %
Hindostan Slips ... ℘ ℔ 10¢ }

Screws.
Flat Head Iron ... dis 75 %
Flat Head Brass ... dis 75 %
Round Head Brass ... dis 65 %
Round Head Iron ... dis 70 %

Spoons.
Plated ... dis 50&5&5 %
German Silver ... dis 40&5 %
Britannia, Boardman's ... dis 60 %
Britannia, Parker's ... dis 60&10 %
Tinned ... dis 10 %

Springs.—Torrey ... dis 50 %
Gem No. 3 small Japanned ... $2.00 } dis 50&10 %
Gem No. 2 medium Japanned ... 2.75 }
Coil No. 10 ℘ gross net ... $6.00
Other Standard Springs ... dis 50&10 %
Warner Door Springs, ℘ doz. $2.50 ... dis 40 %
Standard Spring Hinger—
Single No. 0, ℘ doz. net ... $1.25
Single No. 1, ℘ doz. net ... 1.50
Other Standard Spring Hinges ... dis 25&10 %

Stocks and Dies ... dis 10 and 5 %

Stove Polish.—Gem ... ℘ gross, $4.50, dis 5 %
Dixon ... 6.00, dis 10 %
Fire Fly ... $3.00 gross, net

Tacks ... dis 30&10 %
Shoe Nails—4-8, and over, 8¢ ... } 10 %
Shoe Nails—3½-8, and under, 9¢ ... }
Double Pointed Tacks ... dis 70&10 %

Traps.
Genuine Oneida—Newhouse ... dis 35 %
Im. Oneida—Newhouse list. First qual ... dis 60&10 %

Vises.—Solid Box. Trenton new list ... dis 45 @ 50 %

Wrenches.—Agricultural ... dis 70&10 %
Coes' Genuine ... dis 60&3 %
Coes' Mechanics' ... dis 60&10&3 %
Coes' Mechanics,' Mall. Bar ... dis 70&15 %

Wire.
Bright or Annealed, No. 0 to 18 ... dis 67½ %
Bright or Annealed, No. 19 to 26 ... dis 70 %
Bright or Annealed, No. 27 to 36 ... dis 75 %
Coppered, 0 to 18 ... dis 62½ %
Tinned Broom Wire ... dis 62½ %
Galvanized Barb Wire ... 7¾¢
Painted Barb Wire ... 6¾¢
Galvanized. No. 7 to 18...Market List, dis 47½ @ 50 %

Wringers.
Peerless No. 2½ ... $30.00 }
Peerless No. 2 ... 33.00 }
Universal No. 2½ ... 30.00 }
Universal No. 2 ... 33.00 } dozen lots $3.00 per dozen.
Novelty No. 2, for common tubs ... 30.00 }
Novelty No. 3, " " ... 34.50 }
Excelsior E, for stationary tubs ... 39.00 }
Excelsior F " " ... 43.50 }

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 ℘ cent. for cash, if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.
1¼ to 4 by ⅜ to 1 inch ... 2.5¢
4¼ to 6 by ⅜ to 1 " ... 2.6¢
1⅛ to 6 by 1⅛ to 1¼ " ... 2.9¢
1¼ and 1⅛ by ⅜ to ¾ " ... 2.6¢
1 and 1⅛ by ⅜ to ¾ " ... 2.7¢
⅝, ¾ and ⅞ by ⅜ to ⅝ inch ... 2.9¢

Rounds and Squares.
1 to 1⅛ ... 2.5¢ | ⅝ to 9-16 ... 2.7¢
2 to 2⅜ ... 2.7¢ | ⅜ to 7-16 ... 2.9¢
2¾ to 3¼ ... 3.0¢ | ⅜ ... 3.1¢
3⅜ to 4 ... 3.5¢ | 5-16 ... 3.3¢
4¼ to 5 ... 4.0¢ | ¼ ... 3.5¢
⅜ to ⅞ ... 2.6¢ | 3-16 ... 5.5¢

Oval Iron.
⅞ to 1⅛ ... 2.9¢ | ⅝ ... 3.3¢
⅜ to ¾ ... 3.1¢ | ⅜ ... 3.7¢

Half Oval and Half Round.
⅞ to 1¼ inch ... 3.2¢ | ½ inch ... 4.0¢
⅝ to ¾ " ... 3.7¢ | ⅜ " ... 5.5¢

Horse Shoe.
⅝ to 1⅛ by 5-16 to ⅞ inch ... 3.5¢

Wagon Box Iron.
⅞ inch, Nos. 13 and 14 ... 3.7¢
⅞ " " 11 and 12 ... 3.5¢
¾ " " 13 and 14 ... 4.0¢
¾ " " 11 and 12 ... 3.8¢
⅝ " " 13 and 14 ... 4.4¢
⅝ " " 11 and 12 ... 4.1¢

Heavy Bands.
3½ to 6 by ¼ and 5-16 inch ... 2.7¢
1½ to 3¼ by ¼ and 5-16 " ... 2.7¢
1 to 1⅜ by ¼ and 5-16 " ... 2.8¢
¾ to ⅞ by ¼ and 5-16 " ... 3.0¢
⅝ and ½ by ¼ and 5-16 " ... 3.5¢

Light Bands.
1½ to 6 by ⅛ to 3-16 ... 3.0¢
1½ to 6 by Nos. 11 and 12 ... 3.1¢
1 to 1⅜ by ⅛ to 3-16 ... 3.1¢
1 to 1⅜ by Nos. 11 and 12 ... 3.2¢
⅞ and 13-16 by ⅛ to 3-16 ... 3.4¢
⅞ and 13-16 by Nos. 11 and 12 ... 3.5¢
¾ and 11-16 by ⅛ to 3-16 ... 3.7¢
¾ and 11-16 by Nos. 11 and 12 ... 3.8¢
⅝ and 9-16 by ⅛ to 3-16 ... 4.0¢
⅝ and 9-16 by Nos. 11 and 12 ... 4.1¢
½ inch by ⅛ and 3-16 ... 4.3¢
½ inch by Nos. 11 and 12 ... 4.4¢

Hoop Iron.
1¼ to 4, Nos. 13, 14 and 15 ... 3.3¢
1¼ to 2, Nos. 16, 17 and 18 ... 3.4¢
1¼ to 2, No. 19 ... 3.5¢
1¼ to 2, No. 20 ... 3.6¢
1¼ to 2, No. 21 ... 3.7¢
1¼ to 2, No. 22 ... 3.8¢
15-16, 1, and 1⅛, Nos. 13, 14 and 15 ... 3.5¢
15-16, 1, and 1⅛, Nos. 16, 17 and 18 ... 3.6¢
15-16, 1, and 1⅛, Nos. 19 and 20 ... 3.7¢
15-16, 1, and 1⅛, No. 21 ... 3.8¢
15-16, 1, and 1⅛, No. 22 ... 3.9¢
⅞, Nos. 13, 14 and 15 ... 3.7¢
⅞, Nos. 16, 17 and 18 ... 3.8¢
⅞, Nos. 19 and 20 ... 3.9¢
⅞, No. 21 ... 4.0¢
⅞, No. 22 ... 4.1¢
13-16, Nos. 13, 14 and 15 ... 3.9¢
13-16, Nos. 16, 17 and 18 ... 4.0¢
13-16, Nos. 19 and 20 ... 4.1¢
13-16, No. 21 ... 4.2¢
13-16, No. 22 ... 4.3¢
¾, Nos. 13, 14 and 15 ... 4.0¢
¾, Nos. 16, 17 and 18 ... 4.1¢
¾, Nos. 19 and 20 ... 4.2¢
¾, No. 21 ... 4.3¢
¾, No. 22 ... 4.4¢
11-16, Nos. 13, 14 and 15 ... 4.2¢
11-16, Nos. 16, 17 and 18 ... 4.3¢
11-16, Nos. 19 and 20 ... 4.4¢
11-16, No. 21 ... 4.5¢
11-16, No. 22 ... 4.6¢
⅝, Nos. 13, 14 and 15 ... 4.4¢
⅝, Nos. 16, 17 and 18 ... 4.5¢
⅝, Nos. 19 and 20 ... 4.6¢
⅝, No. 21 ... 4.7¢
⅝, No. 22 ... 4.8¢
⅝, No. 23 ... 4.9¢
9-16, Nos. 13, 14 and 15 ... 4.6¢
9-16, Nos. 16, 17 and 18 ... 4.7¢
9-16, Nos. 19 and 20 ... 4.8¢
9-16, No. 21 ... 4.9¢
9-16, No. 22 ... 5.0¢
9-16, No. 23 ... 5.1¢
½ inch, Nos. 13, 14 and 15 ... 4.8¢
½ inch, Nos. 16, 17 and 18 ... 4.9¢
½ inch, Nos. 19 and 20 ... 5.1¢
½ inch, No. 21 ... 5.2¢
½ inch, No. 22 ... 5.3¢
½ inch, No. 23 ... 5.4¢

The prices under Hoop Iron do not apply to Cotton Ties.

1-10¢ ℘ ℔ extra will be charged for each gauge lighter than the lightest indicated.

1-10¢ ℘ ℔ extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.
1¼ to 2 in., cut to length.
9 to 11 ℔, ℘ set of 6 hoops ... 3.5¢
8 ℔ and less than 9 ℔, ℘ set of 6 hoops ... 3.6¢
Less than — ℔, ℘ set of 6 hoops ... 3.8¢

Extras for Cutting to Length all Preceding Iron,
All Iron, including Tire ... 1.10¢

Tank Iron.
No. 9 and heavier ... 3.3¢
Plow Slabs ... 3.5¢
Plow Wings ... 3.8¢

Sheet Iron.

	Common.	Charcoal.	Juniata.
Nos. 10 to 14	3.5¢	5.0¢	6.5¢
Nos. 15 to 17	3.8¢	5.3¢	6.8¢
Nos. 18 to 21	4.1¢	5.6¢	7.1¢
Nos. 22 to 24	4.3¢	5.8¢	7.3¢
Nos. 25 and 26	4.5¢	6.0¢	7.5¢
No. 27	4.7¢	6.2¢	7.7¢
No. 28	5.1¢	6.6¢	8.1¢

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10¢ extra.

Wood's Patent Planished Sheet.
1st quality (A) ... 10½¢ | 2d quality (B) ... 9.0¢

Galvanized C. H. B.—(Charcoal Hammered Blooms.)
Nos. 14 to 20 ... 12¢ | No. 27 ... 15¢
Nos. 21 to 24 ... 13¢ | No. 28 ... 16¢
Nos. 25 and 26 ... 14¢ | No. 29 ... 18¢
50 @ 52½ % discount.

Coal Screen Iron.
1¾ by ⅝ by 5-16 ... 3.0¢ | 1 by ⅝ by 5-16 ... 3.5¢

Angle Iron.
2½, 3, 3½ and 4 inch ... 3.3¢
1½, 1¾, 2 and 2¼ " ... 3.3¢
1¼ inch ... 3.4¢
1 " ... 3.6¢
1⅛ by 1 inch, for Plow Handles ... 3.8¢
1½ by ¾ " " " ... 3.8¢
1⅜ by ¾ " " " ... 3.9¢

T Rail.
8 lbs. to the yard ... 2.9¢ | 20 lbs. to the yard ... 2.8¢
12 " " ... 2.8¢ | 28 " " ... 2.8¢
16 " " ... 2.8¢ | 30 " " ... 2.8¢

Splice Joints for 12, 16 and 20 ℔. Rail, 40¢ each; 28 and 30-℔. Rail, 50¢ each; 40-℔., 60¢ each.
3½ by ⅝ and ½ Spikes for 20 and 28-℔. Rail ... 3¾¢
2½ and 3 by ⅜ " " 12 and 16-℔. " ... 4.0¢
2½ by 5-16 " " 8-℔. Rail ... 4½¢

Flat Rails.—Punched and Countersunk.
1½ to 2 by ½ to ⅝ inch ... 3.0¢
1½ by ⅜ and 7-16 inch ... 3.2¢
1¼ by ⅜, 7-16 and ½ inch ... 3.5¢

Juniata Nail Rods ... 6.5¢
Norway Nail Rods ... 8.0¢
Guard Iron, ⅞x¾x⅜ and ⅞x⅝x⅜ ... 4.0¢
Guard Iron ⅝x⅝x9-16 and ½x⅝x½ ... 4.2¢
Drag Bars ... 3.3¢
Dropper Bars ... 3.8¢
Cylinder and Landside Iron ... 3.2¢
Plow Beam Iron ... 3.0¢

Nails.
See Pittsburgh Trade Report.

Best Quality Refined Cast Steel.
Square, Flat, Octagon and Round.
⅝ to 2 inches, inclusive ... 9½¢
1-16 and 2⅛ to 3 inches ... 10½¢
¼ and 3⅛ to 4 " ... 11½¢
7-32 and 4⅛ to 5 " ... 12½¢
3-16 and 5⅛ to 6 " ... 15½¢
5-32 inch ... 20½¢
⅛ " ... 25¢
Oil Well Steel Forgings ... 20¢

Machinery Steel.

	Crucible	Bessemer & Open Hearth.
Ordinary Sizes, ⅜ to 2 inch Round	5¢	3¼¢
5-16 and 2⅛ to 3 inches	6¢	4½¢
¼ and 3⅛ to 6 "	7¢	5½¢
7-32 inch	9¢	7¢
3-16 "	11c	9¢

Square, Flat and Octagon, ½¢ extra throughout the list.
Cut to specified lengths, ½¢ extra.

Hammer Cast Steel.
Crucible Cast Steel ... 6¢
Open Hearth Cast Steel ... 5¢

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth.
To 21 gauge	11¢	10¢	8¢	½¢

1¢ extra for each additional gauge.
Cut to multiples or specified lengths, ½¢ extra.

Miscellaneous Cast Steel.
Auger and Auger Bit ... 5¢
Axle Steel for carriages and wagons ... 5¢
Frog Points and Plates ... 6¢
Frog Side Bars ... 5¢
Pick, plain (hammered) ... 6¢
Pick and Mattock, beveled (rolled) ... 5¢
Skate Steel ... 6¢
Table Cutlery, plain ... 5¢
Table Cutlery, beveled ... 6¢
Pike and Cant Hook ... 7¢
Coal and Granite Wedge ... 7¢
Roller ... 7¢
Spindle, subject to Machinery classification ... 6¢
Trap Spring Steel ... 8¢
Forged Crank Pins and Lathe Spindles ... 7½¢
Piston Rods, plain ... 5¢
Piston Rods, forged to shapes ... 7½¢
Slide Bars, plain ... 6¢
Slide Bars, forged to shapes ... 7½c

Open Hearth or Bessemer
Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick ... 4¾¢
Boiler, Fire-Box and Flue Sheets, not less than ⅛ thick ... 6¢
Circulars and semi-circulars, when ordered separately ... 7c
Smoke Stack, to shape ... 6¢
Locomotive Tank Steel ... 5¢

File Cast Steel.
Square, Round, Half Round and Flat Bastard, 8-inch and over ... 5¢
Mill Saw, 8-inch and over ... 6¢
Taper, 3½-inch and over ... 7¢
Horse and Shoe Rasp ... 6¢

Spring Cast Steel ... 5¢
Spiral, Taper, cut to lengths ... 6¢

Tire Cast Steel.
1x¼ and over ... 7¢
1x3-16, ⅞x3-16 and ¼ ... 7½¢
1 and 13-16x⅛ and 5-32, ¾x3-16 and 5-32 ... 9½¢
¾ and ⅝x⅛ and 3-32 and 12 g ... 10¢
Solid Safe Cast Steel ... 6¢
Three and Five Ply Cast Steel ... 8¢

Agricultural Implement Cast Steel.
Fork and Rake, Crucible ... 5¢
Horse Rake Steel, cut to lengths, Crucible ... 6¢
Hoe, Crucible ... 6¢
Corn Stalk Cutter, beveled ... 5¢
Beveled Hoe and Shovel Steel in Bars ... 5¢
Crucible Plow Steel in Slabs ... 5¢

Bessemer and Open Hearth.
Spring ... 3½¢
Spring spiral and taper, cut to lengths ... 4¢
Tire, 2-16 thick and above ... 3½¢
Toe Calk ... 3½¢
Plow ... 3½¢
Axle Billets ... 3½¢
Sleigh Shoe ... 3½¢
Cutter Shoe, cut to lengths and tapered ... 4½¢
Scythe Back Steel ... 4¢
Grain Drill Bars ... 4¢
Grain Drill Points ... 5¢
Rolling Coulter Blanks, cut and punched ... 9½¢
Thrasher Steel ... 4¢
Thrasher Teeth ... 5½¢
Rolled Hammer Billets ... 4¢

Terms.—Four months; 3 per cent. discount for cash, if remitted within 30 days.

Rolls and Castings.
Furnace Floor and Straightening Plates ... 1½¢
Housings and Castings not otherwise specified ... 2½¢
Guide Plates ... 3¢
Spindles and Coupling Boxes ... 2¢
Sand Rolls and Pinions, large size ... 2½¢
Sand Rolls and Pinions, small size ... 3 ¢
Pipe Mill Castings ... 5 ¢
Rolling Mill Castings under 50 ℔ ... 4 ¢
Spur and Bevel Wheels, large ... 4 ¢
Spur and Bevel Wheels, small ... 4½¢
Pulleys up to 30 inches ... 4½¢
Pulleys over 30 inches ... 4 ¢
Engine Castings, light ... 4½¢
Engine Castings, heavy ... 4 ¢

Chilled Rolls.
6 to in. diam., to 20 in. long ... 4 ¢
8 to 15 in. diam., 8 to 40 in. long ... 4 ¢
25 to 24 in. diam., 15 to 72 in. long ... 3½¢
14 to 31 in. diam., 72 to 108 in. long ... 3½¢

After October 1, 1881, no discounts will be made at settlement, as heretofore, prices quoted being net.

White and Red Lead.
Strictly Pure White Lead in Oil in kegs, 6¼¢; in 25 ℔ Tin Pails, ½¢ ℘ ℔ over keg price; 12½ ℔ Tin Pails, 1¢ ℘ ℔ over keg price; assorted, 1 to 5 ℔ cans, 3¢ ℘ ℔ over keg price.
Dry White Lead in barrels ... 6¾¢
Red Lead, very brilliant, in kegs and barrels ... 6¢
Litharge (Potter's Lead) " " " ... 6¢
Freights equalized with all points where White Lead is made.
Terms: Note at 60 days, or if paid within 15 days from date of invoice a discount of 2½ per cent. will be allowed, but not otherwise.

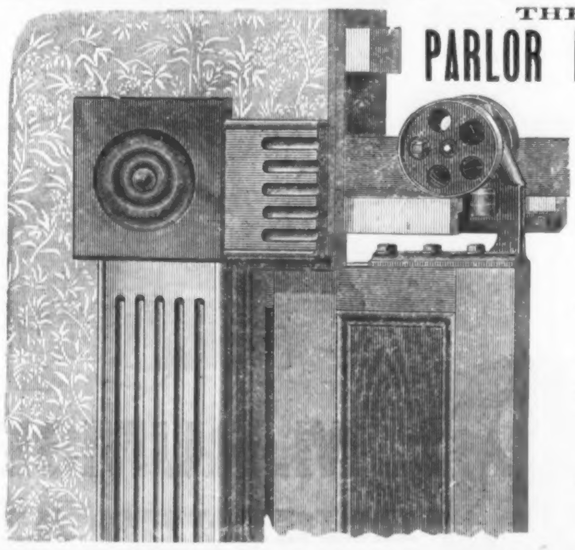
Window Glass.
Discount, 60&10 % on Single Strength, 60&20 % on Double.
Prices current, ℘ box of 50 feet.

United Inches	Sizes.	AA.	A.	B.	C.
	Single Strength.				
25	6 x 8 to 10 x 15	$8.75	$8.00	$7.50	$7.00
39	11 x 14 to 15 x 24	9.25	8.50	8.00	7.25
48	16 x 24 to 20 x 28	10.75	9.75	8.75	7.75
54	15 x 34 to 24 x 30	12.25	10.75	9.00	....
60	26 x 28 to 24 x 36	13.00	11.50	9.75	....
70	26 x 36 to 26 x 44	14.50	13.25	10.75	....
80	26 x 46 to 30 x 50	15.00	14.00	11.25	....
84	30 x 52 to 30 x 54	....	....	....	....
90	30 x 56 to 34 x 56	....	....	....	....
94	34 x 58 to 34 x 60	....	....	....	....
100	36 x 60 to 40 x 60	....	....	....	....
	Double Strength.				
25	6 x 8 to 10 x 15	13.25	12.25	11.25	10.50
39	11 x 14 to 15 x 24	14.50	13.25	12.50	11.25
48	16 x 24 to 20 x 28	17.25	15.75	14.00	....
54	15 x 34 to 24 x 30	19.75	17.25	14.50	....
60	26 x 28 to 24 x 36	21.00	18.50	15.75	....
70	26 x 36 to 26 x 44	23.25	21.25	17.25	....
80	26 x 46 to 30 x 50	24.00	22.50	18.00	....
84	30 x 52 to 30 x 54	25.75	23.25	19.25	....
90	30 x 56 to 34 x 56	27.75	25.00	21.75	....
94	35 x 58 to 34 x 60	29.25	27.75	24.00	....
100	36 x 60 to 40 x 60	33.25	30.00	27.75	....

Sizes above — $10 ℘ box extra for every 5 inches.

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

Hubbard, Bakewell & Co.'s Goods.
Axes, Single Bit, Lippincott ... per doz., $7.25
Axes, Single Bit, James & Co ... per doz., 6.75
Axes, Double Bit, Lippincott ... per doz., $13.00
Axes, Double Bit, James & Co ... per doz., 10.00
Drain Tools, list ... dis 20 %
Hoes, Planters' ... dis 60 %
Hoes, Scovill Pattern ... dis 60 %
Hoes, Handled, Square Eye, German ... dis 50 %
Handles, Cross Cut ... per doz., $2.50
Handles, Shovel, Bent, Bored, Riveted..per doz., 2.25
Saws, Circular ... dis 45 %
Saws, Long ... dis 40 %
Saws, Cross-Cut, H. B. & Co., Champion, per foot net ... $0.30
Saws, Cross-Cut, Lippincott, Champion, per foot net ... $0.27
Shovels, list ... dis 20 %
Spades, list ... dis 20 %
Scoops, list ... dis 20 %



THE "DAVIS"
PARLOR DOOR HANGER
FOR SLIDING DOORS.
Easy to Hang or Adjust.
GUARANTEED THE
Best Working Hanger
ON THE MARKET.
Send for Circulars and Price.
MANUFACTURED BY
SENECA MFG. CO.,
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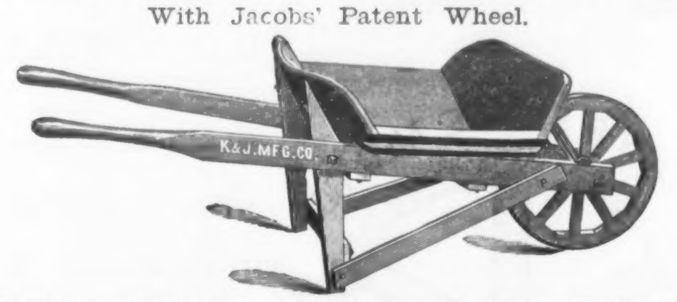
JAMES SMART MFG. CO.,
(LIMITED)
BROCKVILLE, CANADA.

RAILROAD OR CANAL BARROW.
With Jacobs' Patent Wheel.



Full sized, bent tray, planed and well finished. Bolted securely to frame. The legs extend upward, serving as a brace to the bowl, to which they are bolted; they are also bolted to handles. This Barrow has the Jacobs Patent Wheel, superior in every way to any iron wheel manufactured. The wheel revolves on a fixed axle bolt, similar to a buggy wheel. The axle bolt holds the barrow firmly together. The Barrow for Railroad Contractors. Will outwear any other made, and displaces all others wherever introduced. Wheel painted. We also manufacture a full line of

ORE, BRICK, STONE AND GARDEN BARROWS.
Also Road Scrapers, Road Plows, Levelers, &c.
KILBOURNE & JACOBS MFG. CO.,
COLUMBUS, OHIO, U. S. A.

No. 99 IMPROVED CLOTHES WRINGER.

Showing the Wringer with Rolls Set Apart.

FOR SALE BY ALL JOBBERS.

Showing Wringer Ready for Use.

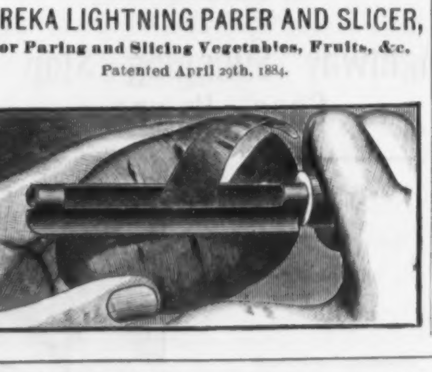
This Wringer has been a favorite for a quarter of a century. The only objection ever made to it was on account of the Rolls flattening under the pressure of its powerful springs when not in use. We have patented a very simple device to overcome this objection. The above cut shows this Wringer as in use, and also with the rolls set apart when not in use. All that is required to throw the rollers apart after using is to turn the crank backward, and while so turning push up the shields at each end of the rolls, as seen in the cut, thus throwing the lower shaft from the upper to the lower side of the lug cast in the shields: this forces the center piece of the shield against the under side of the upper shaft, separating the rolls.
We also use the Moulton Roll, which is a guarantee that they will not turn on the shaft.

PEERLESS WRINGER CO., Cincinnati, Ohio, and 125 Chambers St., New York

P. LOWENTRAUT,
SOLE MANUFACTURER OF THE
EUREKA CLUB SKATE.

(Patented April 19, 1881.)

SOLE MANUFACTURER OF THE
EUREKA LIGHTNING PARER AND SLICER,
For Paring and Slicing Vegetables, Fruits, &c.
Patented April 29th, 1884.



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MECHANICS' TOOLS
GENERAL HARDWARE.
Light and Heavy Steel Ladles a Specialty.
HOUSE FURNISHING GOODS
AND
SHOEMAKERS' TOOLS,
276, 278, 280, 282 Halsey St.,
NEWARK, N. J.

PHILADELPHIA BLACK LEAD CRUCIBLE WORKS,
1324 to 1334 Callowhill St., Philadelphia, Pa.
R. B. SEIDEL, MANUFACTURER OF SUPERIOR BLACK LEAD CRUCIBLES,
For Melting Steel, Brass and other Metals. Black Lead Stopper, &c., for Bessemer Steel Makers.
Also manufacturer of superior quality Hammered Charcoal Iron of different sizes and shapes.

THE COLUMBUS WROUGHT STEEL SINK,
FOR BUTLER'S PANTRY AND KITCHEN. (Pat. April 12, 1881.)

Entirely new, being stamped from one plate of steel and superior to cast-iron sinks in every particular, being *lighter*, *stronger* and *more durable*.

These sinks, being made of *wrought steel*, will not break from heat, cold, or *any cause whatever*.

We furnish these sinks painted or galvanized, as desired, at prices —freedom from breakage considered—less than for sinks made from cast iron.

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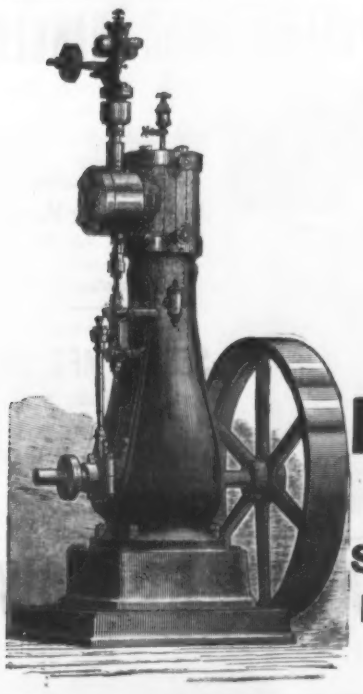
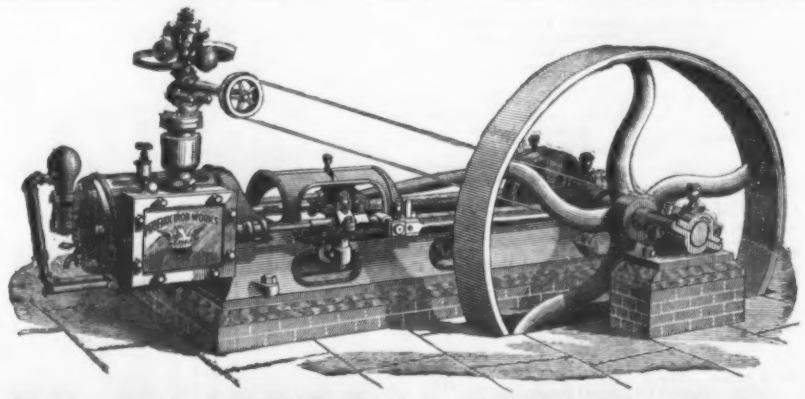
THE KILBOURNE & JACOBS MFG. CO., Sole Manufacturers, COLUMBUS, OHIO.





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FOUNDRY & MACHINISTS' SUPPLIES,

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STOCKS CARRIED AT THEIR WORKS IN PROVIDENCE, AND WITH THEIR APPOINTED AGENTS THROUGHOUT THE COUNTRY.

The Scientific Portable Forges

HAND AND POWER BLOWERS,

Exhaust Fans, &c.

NEW IN PRINCIPLE,
SUPERIOR IN CONSTRUCTION,
EXCELLED BY NONE.

Made in different styles and sizes for all kinds of work. Examine the "SCIENTIFIC" before you buy. Illustrated Catalogue furnished by

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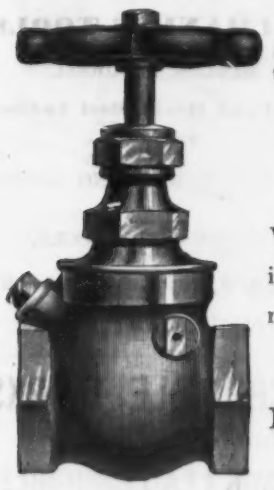
GENERAL EASTERN AGENTS.

THE FOOS MANUFACTURING CO.,

Springfield, Ohio.

FOR SALE BY THE TRADE.



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Straightway Swinging Stop and Check Valves.

The only Straightway Valve that can be ground in without being disconnected from Pipes.

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SOLE AGENTS,

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THE HANCOCK INSPIRATOR

The Standard for Stationary, Marine, Locomotive

AND ALL CLASSES OF BOILERS.

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Adopted by the Largest Mills and Manufactories.

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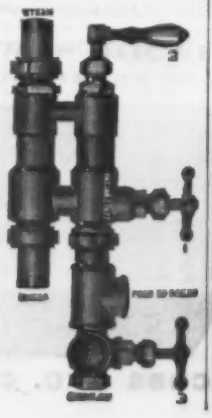
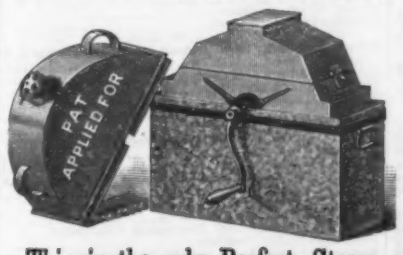


O. K. STEAM WASHER



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A Trial and Comparison will Convince You of the Fact!

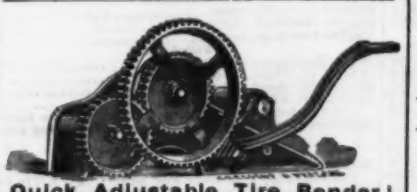
It is simple and durable, will wash any clothes without the use of a washboard. It will wash 15 to 20 Shirts in 20 minutes, Calicoes and Flannels in less time.

Agents wanted in every TOWN and CITY in the United States. Write for circulars.

O. K. STEAM WASH CO.,

Okawville, Illinois.

Parties in Iowa, Missouri, Kansas, Arkansas, and Texas, should correspond with the DIAMOND CAN CO., ST. LOUIS, MO., sole Agents for those States.



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SIZES.....No. 1 and No. 2.
PRICES..... $10 " $12.

IMPROVED AUTOMATIC TIRE AND AXLE UPSETTER

SIZES.....No. 1 and No. 2.
PRICES..... $10 " $12.

E. C. TROMBLY & CO. MFG. CO.,

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OVERHEAD RAILWAY,

With Switches and Turntables,

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WITH AUTOMATIC STOP.

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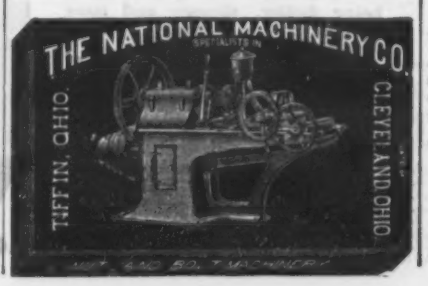
NEW YORK.



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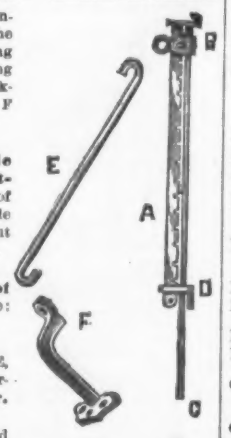
A represents the Stationary Locking Bar; B the Self-Locking Adjusting Block; C the Operating Rod; D the Lower Bracket; E the Lifting Arm; F the Transom Bracket.

With this **Adjustable Locking Bar and Lifting Arm,** the opening of the transom can be made larger or smaller without the least inconvenience.

Regular Sizes of Lifters for the Trade: ¼ in., 5-16 in. and ⅜ in.

Duplicates of Arm E, in different lengths, furnished with **first order.**

Catalogues furnished on application.

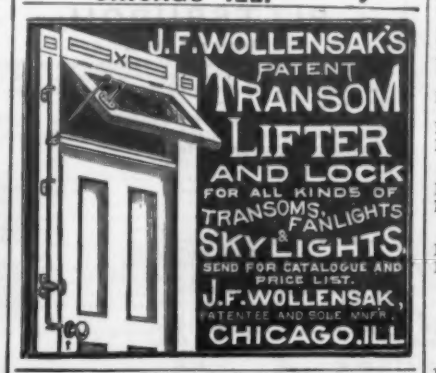


F. A. REIHER & CO.,

EXCLUSIVE MANUFACTURERS

Nos. 11 & 13 South Canal St.,

CHICAGO ILL.



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COHOES, N. Y.

BOSTON.

Reported by Bigelow & Dowse.

Anvil & Vise.—
No. 1, $5.25; 2, $4.25; 3, $3.50 each.....dis 25 %

Augers & Bitts.—
L'Hommedieu's Ship Auger.....dis 15 %
Jenning's Bitts.....dis 25 %
Cook's Bitts.....dis 40 & 10 %
Shepardson's Double-Cut Bitts.....dis 45 %
Shepardson's Double Gimlets.....dis 40 %
Stearn's Extension Hollow Augers—
No. 2, ₱ doz., $48; No. 3, ₱ doz., $60 list.....dis 20 %
Bonney's Extension Hollow Augers.....₱ doz $36.00
Snell's Bitts.....dis 60 %
Pierce's Bitts.....dis 50 %
Griswold Bitts.....dis 60 %

Axes.—Blue Jackets.....₱ doz $7.50
Dowse Handled Boys'.....dis 35 %

Ax Handles.—
Oak Extra, 31 in., No. A.....₱ doz $2.50
Oak Extra, 34 in., No. A.....₱ doz 2.50
Oak Extra, 31 in., No. B.....₱ doz 2.00
Oak Extra, 34 in., No. B.....₱ doz 2.00
Oak Extra, 31 or 34 in., No. C.....₱ doz 1.40

Axle Clips......dis 50 %
Balances.—Chattilon's.....dis 40 %

Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers).....₱ ft., 2¢
Cast Half Round.....₱ ft., ⅝ 3¢; ¾ 4¢
Wrought Round.....₱ ft., ⅝ 3¢; ¾ 4¢; ⅞ 5¢
Bells.—Connel's Crank Gong, reduced list..dis 15 & 10 %

Bird Cages.
Japanned M. B. & D., reduced list, 1879.....dis 40 %
Brass M. B. & D. reduced list, 1879.....dis 33⅓ %

Blind Fasts.
No. 6 Fasts.....₱ C sets 6.00
Veazie Fasts.....₱ C sets 6.00
Shedd's.....₱ C sets 6.50
Blind Hinges.—Mall. Hook, 3 holes..₱ C sets 7.00

Brad Awl Handles.—
Phœnix Adjustable.....₱ doz $2.00

Bolts.—Norway Iron Carriage.....dis 75 & 10 %
Common Carriage.....dis 80 & 20 %
Eagle Carriage.....dis 75 & 10 %
Borax.—Refined.....₱ ℔ 13¢

Boring Machines.—
Eagle Upright, each.....$5.50 list; dis 50 %
Eagle Angle, each.....6.75 list;
Braces.—Barber's.....dis 40 & 5 %
Spofford's.....dis 50 & 5 %
Backus's.....dis 50 & 5 %

Bracket Saws.—Holly Scroll Saw.....each $2.25
Bracket Saws, extra quality, to No. 5.....₱ gro. 0.75
Steel Frame, with patterns.....₱ doz 6.50
Lester.....dis 20 %
New Rogers, all iron.....dis 25 %

Bracket Saw Blades.—Griffith's pat., ₱ gross 75¢

Brackets.—
H. B. & M. Flower Pot, reduced list.....dis 15 & 10 %
Bronzed Shelf, M. B. & D., new list.....dis 50 & 10 %
Store Shelf.....dis 40 & 10 %

Butts.—Union Fast Joint.....dis 40 & 10 & 10 %
Union Loose Joints.....dis 60 & 10 %
Union Japanned Acorn.....dis 60 & 10 %
Union Silvered Acorn.....dis 60 & 10 %
Union Boston Finish.....dis 70 & 10 %
Union Spiral Spring.....dis 25 & 10 %
Wrought Brass.....dis 65 & 10 %

Carriage Bolts.—Eagle Norway.....dis 75 & 10 %
Common.....dis 80 & 20 %

Carriage Jacks.—Climax No. 1.....₱ doz $20.00
Climax No. 1½.....₱ doz 15.00
Climax No. 2.....₱ doz 13.50
Universal.....dis 25 %
Universal No. 1.....each $2.00
Universal No. 2.....each 3.00
Universal No. 3.....each 6.00
Universal No. 4.....each 6.00
Universal No. 5.....each 6.50

Cartridges.—U. S. Cartridge Co.....dis 50 & 10 %

Cards.
Watson's make Horse & Curry....dis 10 %
Watson's Cotton.....dis 10 %
Watson's Wool.....dis 10 %
} Rev. List, Aug., 1883.

Casters.—Bed and Table.....dis 50 & 10 %

Chain.—Traces 6¼, 10, 4, straight.....₱ pair 50¢
Traces 6¼, 10, 4, twisted.....₱ pair 55¢
Traces 7, 12, 3, twisted.....₱ pair 80¢
Coil 3-16.....₱ ℔ 10¢
Coil ¼.....₱ ℔ 7½¢
Coil 5-16.....₱ ℔ 6½¢
Coil ⅜.....₱ ℔ 6½¢
Coil 7-16.....₱ ℔ ¢
Coil ½.....₱ ℔ 5¢

Chalk.—White, Carpenter's.....₱ gross 60¢
Red, Carpenter's.....₱ gross 80¢
Blue, Carpenter's.....₱ gross $1.00
Crayons.....12¢

Chisels.—Hart, Bliven & Mead, Fram'g..dis 60 & 10 & 10 %
Underhill, Framing.....dis 35 %
Buck's Chisels.....dis 30 %

Coal Hods.—"Dover."—Galv'd, New List....dis 60 %
Japanned, New List.....dis 60 %

Cocks.—Brass. L. F. & Co.....dis 50 & 10 %

Coffee Mills.—New List.....dis 45 %

Copper Rivets.—.....dis 50 %

Cordage.—Manila, usual trade dis 1¢.....₱ ℔ 15½¢
Jute.....₱ ℔ 8¢

Cow Ties......dis 40 %
No. 30 3 ft. No. 6 Wire, with toggle.....₱ doz $3.80
No. 35, 3 ft. No. 6 Wire, with snap.....₱ doz 4.00
No. 40, 3½ ft. No. 6 Wire, with toggle.....₱ doz 4.30
No. 45, 3½ ft. No. 6 Wire, with snap.....₱ doz 4.50
No. 50, 4 ft. No. 4 Wire, with toggle.....₱ doz 4.75
No. 55, 4 ft. No. 4 Wire, with snap.....₱ doz 5.00
No. 60, 4½ ft. No. 3 Wire, with toggle.....₱ doz 5.00
No. 65, 4½ ft. No. 3 Wire, with snap.....₱ doz 5.80

Crow Bars.—Cast Steel.....₱ ℔ 7¢
Iron Steel-pointed.....₱ ℔ 6¢

Cutlery.—Pocket American Shear Co.'s.....dis 40
Butcher Knives, Wood's, Lap Bolster, Square Handle.....dis 40 %
Steak Knives.....dis 40 %
Lap Bolster, Oval Handle.....dis 40 %
Sticking.....dis 40 %
Skinning.....dis 40 %
Butcher, Common Round Handle, Wood's....dis 40 %
Shoe Knives, Wood's.....dis 30 %

Dividers.—Cook's.....dis 25 %

Dog Collars......dis 20 %

Door Springs.—Iron Rod.....₱ doz $1.62
Imitation Torrey's Rod.....₱ doz 1.45
Gem Coil, new list.....dis 50 & 10 %
Crown.....₱ doz $1.25
Warner's.....₱ doz 2.00

Door Stops.—Thurston's.....dis 50 %

Drawer Knobs.—Thurston's.....dis 50 %

Drills.—Morse Bitt Stock, Morse Straight Shank.....dis 40 %

Emery.—Wellington Mills.....₱ ℔ 10¢
Walpole Emery Mills.....₱ ℔ 5¢
Turkish, in 10 ℔ cans.....₱ ℔ 7¢

Enameled Ware.—
Standard Mfg. Co. Kettles.....dis 60 %
Standard Sauce Pans.....dis 30 %

Felloe Plates.—Wrought.....₱ ℔ ¢

Files.—American File Co.....dis 50 %
Nicholson File Co.....dis 50 %

Fluting Machines.—Knox List, $4.00.....dis 25 %

Forks.—W. C. & Co. Manure.....dis 50 %
Eastern Tool Co.'s. Manure.....dis 60 %

Gimlet Bits.—
Genuine German, No. 125, 1-32 to 8-32.....₱ doz $1.00
Pierce's.....₱ doz .88

Glass Cutters.—Combination Glass Cutter and Knife Sharpener.....₱ doz $1.00

Grub Hoes.—K. P. & Co.'s No. 2, $11.50 ₱ doz. dis 50 %

Hammers.—Maydole's.....dis 15 %
Hartford Hammer Co.....dis 20 %

Hangers & Rollers.—Anti-Friction.....dis 50 %
Acme Rollers.....dis 50 %
Climax.....dis 50 %
Common Hangers.....dis 50 %
Common Rollers.....dis 50 %
Victor Hangers.....dis 33⅓ %
Victor Rail.....dis 40 & 10 %

Hand Screws......dis 10 %

Hatchets.—C. F. Dowse, new list.....dis 35 %
Underhill.....dis 35 %

Hay Knives.—Lightning.....₱ doz $18.00, net

Hinges.—Strap and T (new list).....dis 60 & 10 %
Providence Plate.....₱ ℔ 5¢
Wrought Screw Hook.....₱ ℔ 5¢

Hoes.—Eastern Tool Co.....dis 60 & 10 %
W. C. & Co.'s.....dis 60 %

Hooks and Staples.—Brewers (new list)...dis 60 %

Horse Nails.

	No. 6	7	8	9	
Putnam Pointed	.24	.22	.21	.20	.....5 & 7 %
Bridgewater	.21	.19	.18	.17	.....30 %

Ice Cream Freezers.—Packer's, new list..dis 50 & 5 %

Knobs.—"Norwalk." New list.....dis 60 & 2 %
Silver Glass.....dis 50 & 10 %
Silver Glass Bell Pulls.....dis 50 & 10 %

Lanterns.—Tubulars, No. 0.....₱ doz $7.50

Lawn Mowers.
The "Daisy," 12 in. cut.....each, $8.00
The "Daisy," 14 in. cut.....each, 8.50
The "Daisy," 16 in. cut.....each, 9.00
The "Daisy," 18 in. cut.....each, 9.50
Continental.....dis 40 & 10 %
Quaker City.....dis 40 & 5 %
National.....dis 50 %

Lead.—Sheet.....₱ ℔ 5½¢
Pipe.....₱ ℔ 5½¢

Locks.—Norwalk.....dis 60 & 2 %
Eagle Cabinet.....dis 45 %
Eagle Trunk.....dis 15 %
W. Wilcox & Co., Padlocks.....dis 45 %

Manure Forks.—W. O. & Co.....dis 50 %
Eastern Tool Co.'s.....dis 60 %

Mattocks.
K. P. & Co., Long Cutter, $16.00 ₱ doz.....dis 50 %
K. P. & Co., Short Cutter, $15.50 ₱ doz.....dis 50 %
K. P. & Co., Pick Cutter, $16.00 ₱ doz.....dis 50 %

Measuring Tapes.—Eddy's.....dis 20 %

Meat Cutters.—Miles' Challenge.....dis 30 %
Hale's (new list).....dis 40 & 10 %
American.....dis 25 %

Money Drawers.—Tucker's Alarm....₱ doz $22.50

Mouse Traps.—Delusion.....₱ doz 1.25
Novelty.....₱ doz

Nails......₱ keg

Oilers.—Zinc and Tin.....dis 60 %
Brass and Copper.....dis 50 %

Ox Bows.—Extra finished and varnished....dis 10 %
1¼ in., ₱ doz. pair...$7.00 | 2 in., ₱ doz. pair..$10.00
1⅝ in., ₱ doz. pair... 9.00 | 2¾ in., ₱ doz. pair.. 12.00

Paper.—Common Tarred Sheathing.....₱ ℔ 1½¢
Eagle Brand Tarred Sheathing.....₱ ℔ 2 ¢
Common, Dry Sheathing.....₱ ℔ 1½¢
Eagle Brand Dry Sheathing.....₱ ℔ 2½¢

Picks.—K. P. & Co., Adze Eye, 5 to 6 ℔ $12.00. dis 50 %
K. P. & Co., Adze Eye, 6 to 7 ℔ $13.00.....dis 50 %

Planes.
Auburn Tool Co., Bench.....dis 20 %
Auburn Tool Co., Fancy.....dis 15 %
Auburn Tool Co., English Iron.....dis 15 %
N. Y. Tool Co., Bench.....dis 25 %

Plated Ware.—Rogers & Bro.....dis 50 %

Pliers.—Vom Cleff & Co.'s.....net list
Button's Wire Pliers.....dis 33⅓ %

Plumb & Levels.—Stanley R. & L. Co..dis 65 & 10 %

Pocket Knives.—American Shear Co.'s.....dis 40 %

Potato Diggers.—W. C. & Co., reduced list..dis 50 %
Eastern Tool Co.'s.....dis 60 %

Pulleys.—Acme or Excelsior, 1¾ in.....₱ doz 22¢
Acme or Excelsior, 2 in.....₱ doz 25¢

Pulley Blocks......dis 40 %

Pumps.—Union Manufacturing Co.
Iron Cistern.....dis 40 %
Iron Pitcher Spout.....dis 50 %
Copper.....dis 30 %

Rivets.—Black (new list).....dis 40 %
Carriage in 10 ℔ papers (new list).....dis 40 %
Copper.....dis 50 %

Razors.—Torrey's.....dis 20 %
Rules.—Stanley, Boxwood.....dis 70 & 10 %
Stanley, Ivory.....dis 50 & 10 %

Sad Irons.—Common.....₱ ℔ 3¢
Laundry.....₱ ℔ 6½¢
Tailors' Geese.....₱ ℔ 6 ¢
Enterprise "Potts'".....dis 35 %

Sash Locks.—King & Hutchinson's, new list.dis 40 %
Sandpaper.—Baeder & Adamson.....dis 35 %
Sash Weights.—Patent Eye.....₱ ℔ 1½¢
Saws.—Hand Saws, Disston's.....dis 20 %
Cross-Cut Saws.
Disston's, Common Tooth.....₱ foot 68¢, dis 40 %
Disston's Great American Tooth..₱ foot 68¢, dis 40 %
Boynton's Lightning Tooth.....₱ foot 45¢
M. B. & D., Hand Saws.....dis 33⅓ %
W. M. & Co.'s Circular Saws.....dis 25 %
Richardson Bros.....dis 25 %

Saw Blades.—Disston.....dis 20 %
W. M. & C.....dis 10 %
Welch & Griffith, Extra.....₱ doz $8.40
Welch & Griffith, No. 2.....₱ doz 7.00

Scales.—Fairbanks.....dis 20 %

Screws.
American Flat-Head Iron.....new list, dis 75 %
American Flat-Head Brass.....new list, dis 75 %
American Round-Head Brass.....new list, dis 65 %
American Round-Head Iron.....new list, dis 70 %
Grilley Round-Head Nickel-Plated Common..dis 50 %

Scythes.—Clippers, in boxes.....₱ doz $6.50

Shaves.—Kimball's.....₱ inch 7½¢
Watrous.....dis 25 %

Shears.—American Shear Co., new list.....dis 70 %

Shot.—Tatham's.....₱ ℔ 6¢

Shovels.—O. Ames, new list.....dis 17½ %
O. Ames, other brands, new list.....dis 17½ %

Sinks.—Magee Patent.....dis 30 %

Snow Shovels......$4.00

Skates.—Union.....dis 25 %
Acme.....dis 25 %
Oxford Rink Roller.....₱ pair, $2.50
Union Roller.....dis 25 %

Stocks and Dies.—King's.....dis 10 & 5 %

Tacks.
Swedes Tinned.....dis 30 & 10 %
Swedes Iron.....dis 30 & 10 %
Gimp and Lace.....dis 20 & 10 %
Copper Tacks.....dis 30 & 10 %
All balance on list.....dis 20 & 10 %

Traps.—Oneida, Genuine.....dis 33⅓ %
Oneida, Imitation, H. & N.....dis 60 %
Blake's.....dis 40 & 10 %

Vises.—Simpson's Adjustable.....dis 25 & 5 %
Howard Vise Co.....dis 25 %
Prentiss'.....dis 20 %

Weather Strips.—Packer's.....₱ doz $4.50
Browne's Flexible Rubber.....dis 30 %
In 25 feet boxes: No. 1, ⅜ in. wide, ₱ yard, 10¢; No. 2, ½ in., 15¢.; No. 3, ¾ in., 20¢.: No. 4, 1 in., 25¢
Black Walnut Spring Weather Strips.....₱ doz $3.50

Window Springs......dis 20 %
Babcock's No. 3.....₱ gross $6.25
Babcock's No. 4.....₱ gross 4.15

Wire Cloth.—"Clinton".....₱ sq. ft 2 ¢

Wire Fence.
Washburn Painted Barbed.....₱ ℔ 5 ¢
Washburn Galvanized Barbed.....₱ ℔ 6 ¢

Wire Goods.—Gate Hooks and Eyes, &c., dis 70 & 10 %

Wrenches.—A. G. Coe's.....dis 60 %
Girard Mfg. Co.....dis 60 & 10 %
Girard Adj.....dis 70 & 10 %
"Always Ready".....dis 25 %

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Novelty for Common Tubs No. 2—10-inch.₱ doz $30.00
" " " " No. 3—11-inch.₱ doz 34.50
Excelsior for Stationary Tubs No. E—10-inch.....₱ doz 39.00
Excelsior for Stationary Tubs No. F 11-inch.....₱ doz 43.50
Excelsior with Folding Bench No. A—10-inch.....₱ doz 48.00
Excelsior with Folding Bench No. B—11-inch.....₱ doz 52.50
Novelty Set Tub, E.....₱ doz .....
Keystone, Wood Frame No. 1½.....₱ doz .....
Keystone, Iron Frame No. 2½.....₱ doz .....

Zinc......₱ ℔ 6¢

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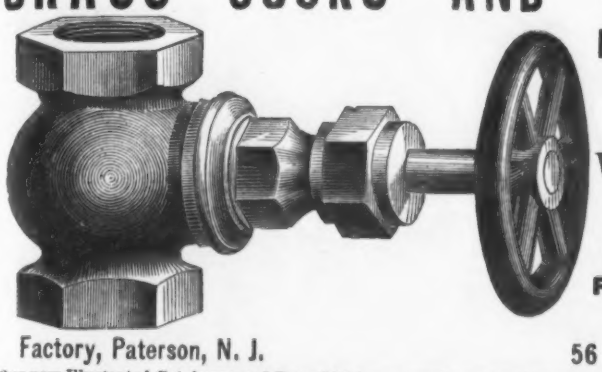

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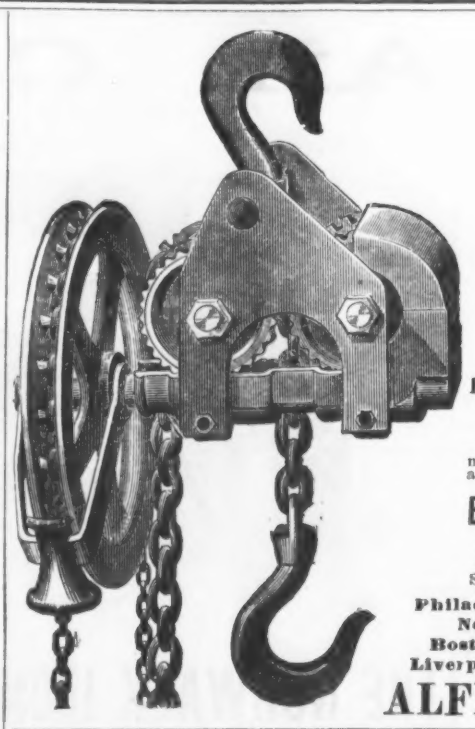

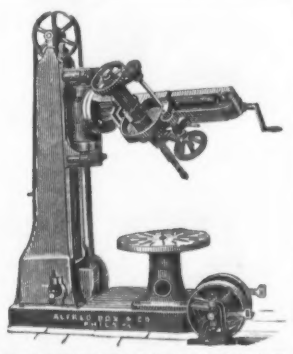

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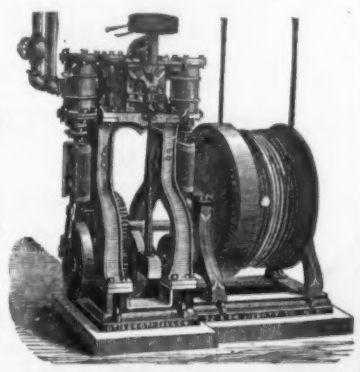

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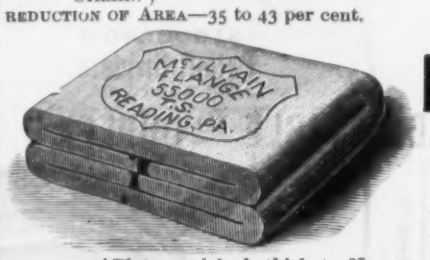

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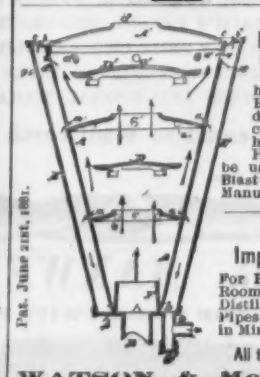

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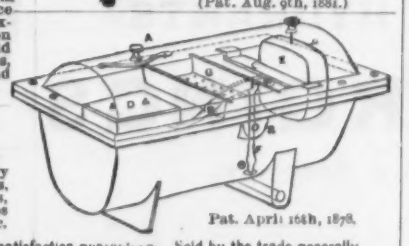

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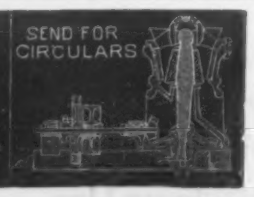

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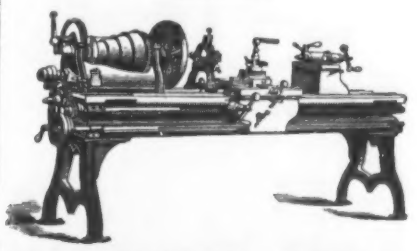

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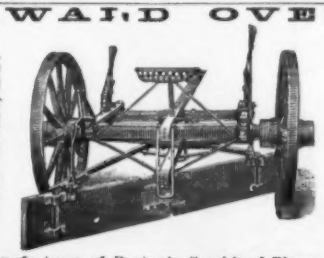

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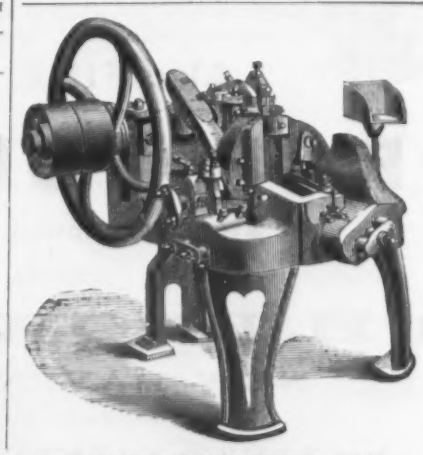

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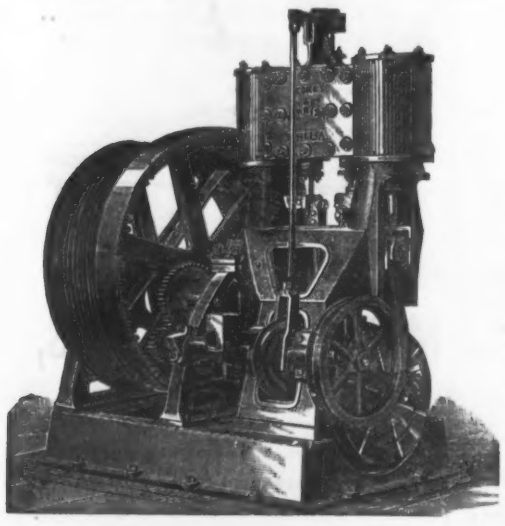

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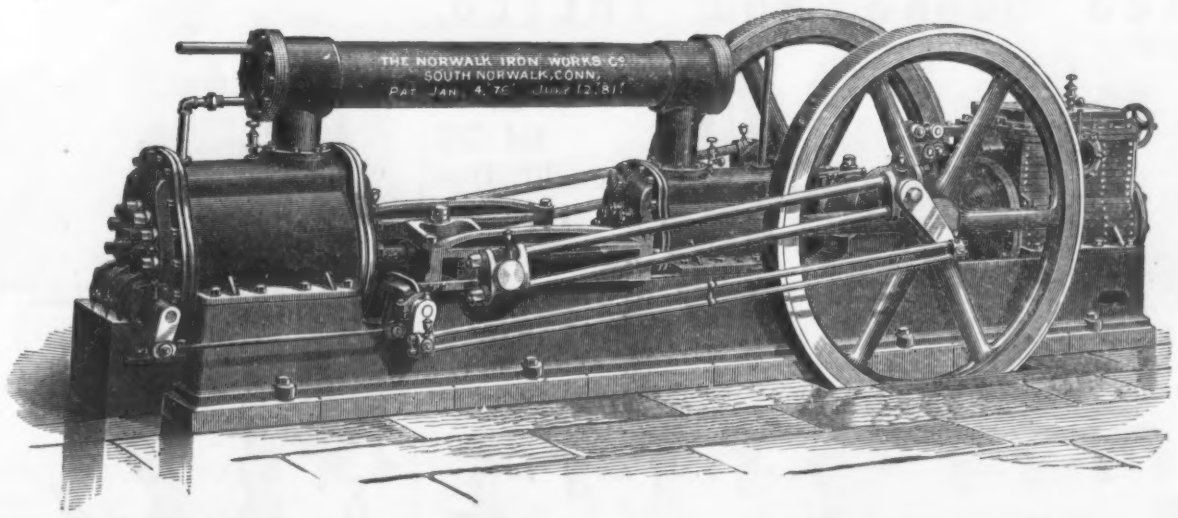

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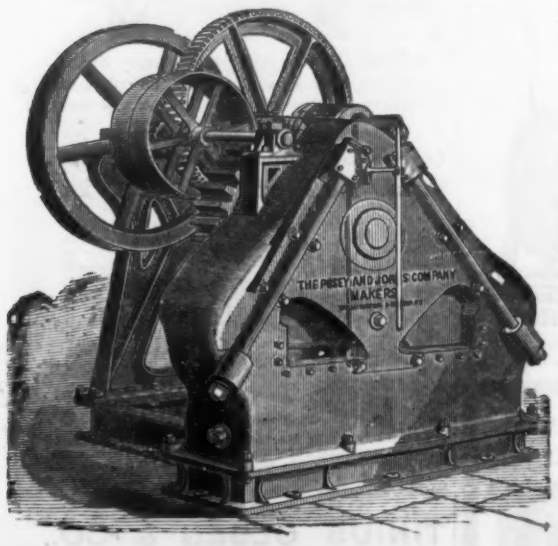

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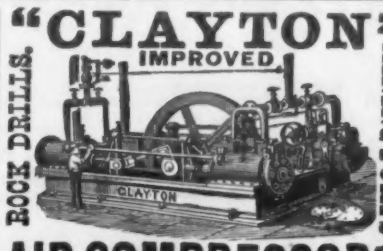

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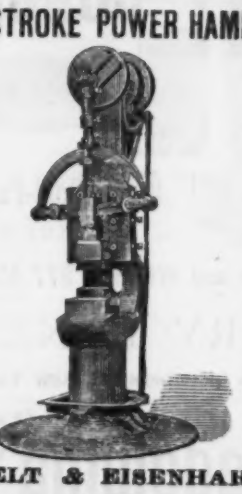

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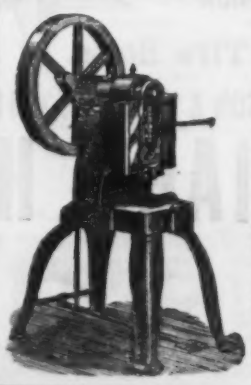

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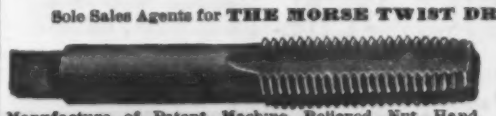

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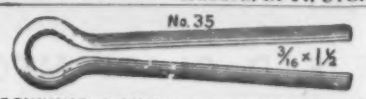

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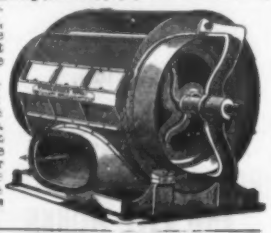

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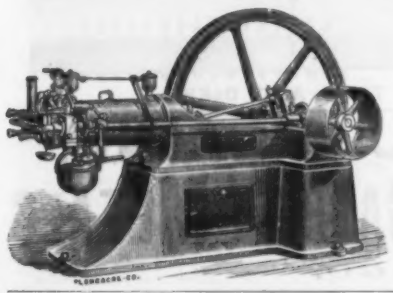

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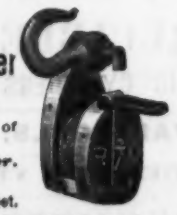

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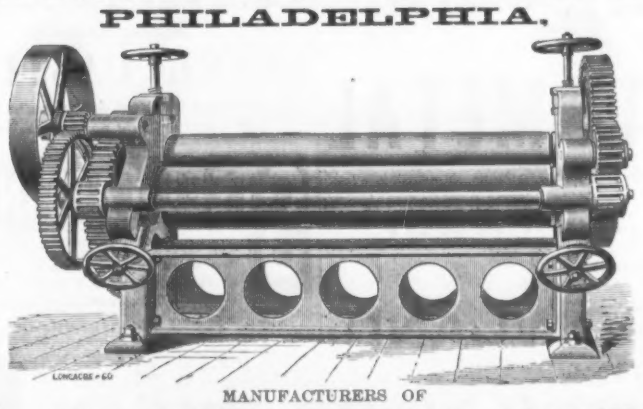

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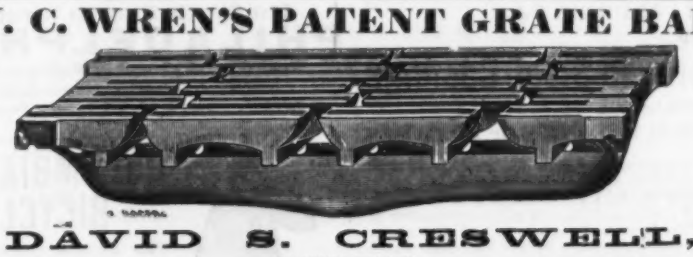

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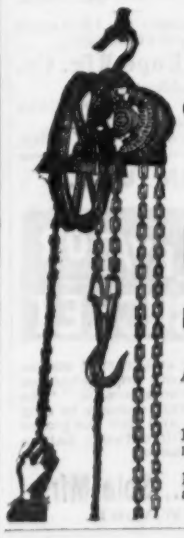

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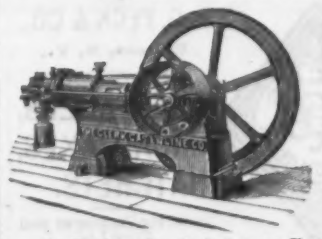

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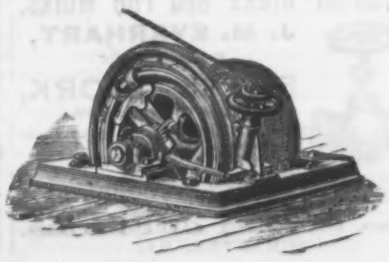

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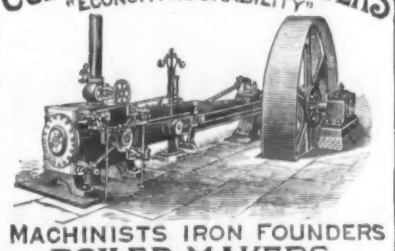

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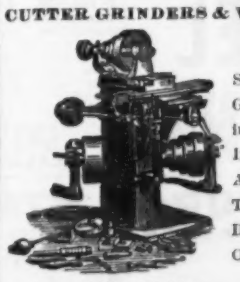

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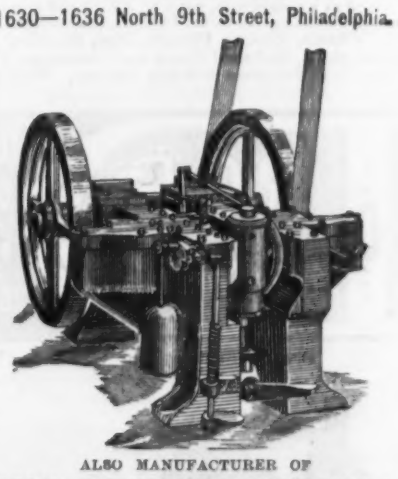

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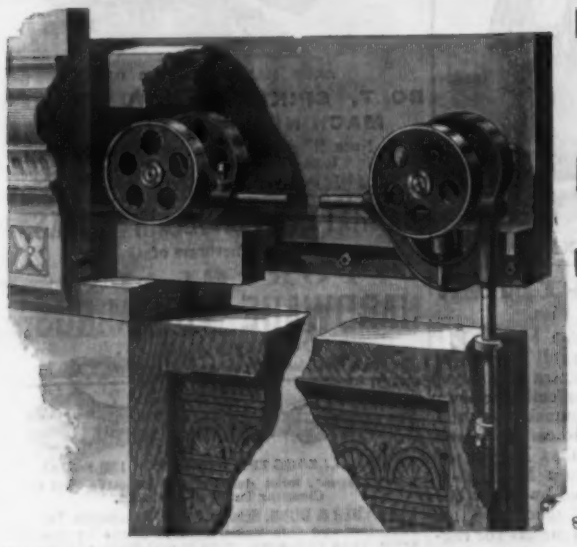

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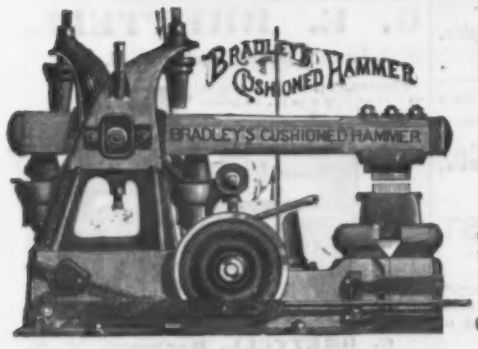

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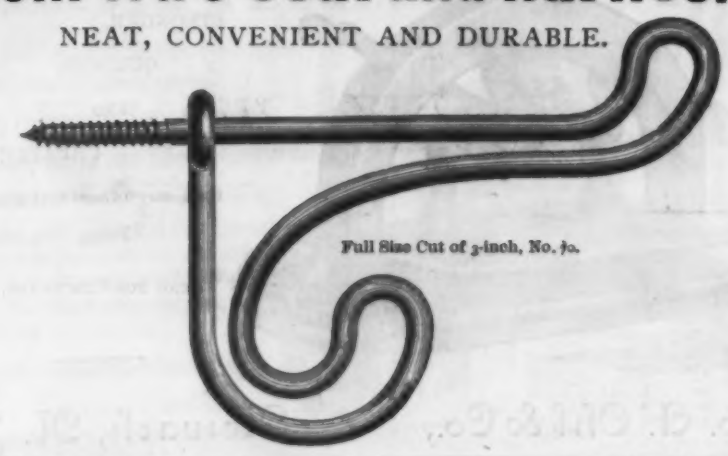

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